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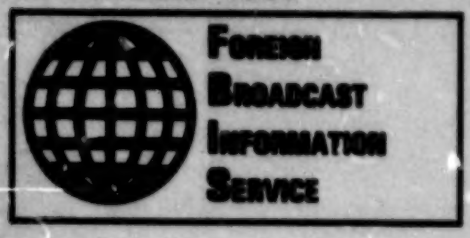

JPRS Report

Nuclear Developments

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JPRS-TND-90-017 *15 OCTOBER 1990*

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FRANCE

NORWAY

SOUTH AFRICA

Nation Ready To Sign NPT, With 'Conditions'

MB1709190490 Johannesburg SAPA in English 856 GMT 17 Sep 90

[Text] Pretoria Sept 17 SAPA—South Africa is ready to sign the Nuclear Non-proliferation Treaty [NPT], but on certain conditions, Foreign Affairs Minister Pik Botha said on Monday night [17 Sep].

"The South African Government is prepared to accede to the treaty in the context of an equal commitment by other states in the southern African region," he said in a statement. "Viewed within the context of the government's irreversible reform initiatives, the proposed action underscores South Africa's commitment to contribute to peace and regional security" in the region, he added.

Mr. Botha said the move followed several rounds of discussions with the main signatories to the treaty—the United States, the Soviet Union and the United Kingdom. It was also taken in the light of dramatic changes in Central and Eastern Europe, "which have led to a lessening of tension" between the superpowers.

"Indeed, the South African Government has itself consulted a number of African governments on the desirability of establishing a nuclear-free area at least in the southern African region," the foreign minister said in the statement issued in Pretoria.

"Such a move would further remove suspicions and should strengthen the economic and geographical cohesion of the region." South Africa is an important uranium exporting country and has a well developed nuclear programme.

INDONESIA

Sudharmono, Iranian Official on Atomic Energy

BK0609122190 Jakarta ANTARA in English 0936 GMT 6 Sep 90

[Text] Jakarta, Sep 6 (OANA-ANTARA)—Vice President Sudharmono accepted the invitation to visit Iran by the first vice president [title as received] of the Iranian Islamic Republic concurrently president of the Iranian Atomic Energy Organization, Reza Amrollahi, when he paid a courtesy call on the Indonesian vice president at Merdeka Selatan Palace here on Thursday.

Reza Amrollahi is currently in Indonesia to attend the international meeting to discuss the problem of expenses for the development of nuclear reactors in developing countries as well as to hold discussions on bilateral cooperation with Indonesia. He called on Vice President Sudharmono to discuss efforts to enhance cooperation in the atomic energy development for peaceful purposes, such as the production of electric energy.

No time for the visit of Vice President Sudharmono to Iran had so far been fixed.

Energy Minister Views Need for Nuclear Plants

BK2109055190 Jakarta Domestic Service in Indonesian 0000 GMT 21 Sep 90

[Text] Mining and Energy Minister Ginanjar Kartasasmita has stated that Indonesia must possess nuclear power plants by the year 2000 to meet growing electricity demands. Giving a lecture to delegates of the Islamic Students Association Congress in Jakarta last night, Minister Ginanjar said electricity demands in Java will reach 16,000 megawatts by 2000. This means an additional 10,000 megawatts will be needed, while only 5,800 megawatts will be generated in the last year of the fourth five-year plan. According to Minister Ginanjar Kartasasmita, after considering various factors, nuclear power plants will be advantageous.

JAPAN

Outline of Japanese-French Nuclear Power Agreement Released

90WP0110Z Tokyo GENSHIRYOKU SANGYO SHIMBUN in Japanese 17 May 90 p 4

[Text] The current special session of the Diet which will last through 26 June is devoted to nuclear power. Consideration of the new Japanese-French Nuclear Power Cooperation Agreement which has been offered for approval began with the start of explanations concerning intent at the plenary session of the House of Representatives on 17 May. The agreement deals directly with the regulation of secret technologies for reprocessing, the first time Japan has done so. It takes the form of concluded protocols which revise the agreement reached in 1982. This article will present the high points of what the postrevision agreement is like. You may wish to refer to the Nuclear Nonproliferation Handbook (published by the Japan Atomic Industrial Forum) and Science and Technology Code 6 (Taisei Publishing) for details about the previous agreement.

Article 1

1. In accordance with this agreement, in order to develop and promote peaceful, nonexplosive uses of atomic energy, the governments of both treaty nations will cooperate in the following ways:

a. Both governments will assist in cooperation between public and private organizations within both countries through the exchange of experts, especially researchers and technicians. When these types of exchanges take place after the initiation of agreements or arrangements between Japanese and French organizations, both governments will facilitate entry into and travel within their territory for these experts.

b. Both governments will facilitate the exchange of public information between individuals within their jurisdictions and between individuals under their own jurisdiction and those under the other government. The conditions regarding the exchange of this information will be determined on a case-by-case basis with the mutual consent of the individuals and governments concerned.

c. Either government or appointed individuals under its jurisdiction will be able to give to or receive from the other government or appointed individual under its jurisdiction, materials, nuclear substances, equipment, facilities, and secret technologies necessary for the peaceful, nonexplosive use of atomic energy. The conditions of this giving and receiving will be determined on a case-by-case basis with the mutual consent of the individuals and governments concerned.

d. Within the scope of this agreement and under conditions to be determined on a case-by-case basis with the mutual consent of the individuals concerned, both governments or appointed individuals under their jurisdictions will be able to provide services to or accept services from the other government or appointed individuals under its jurisdiction.

2. In order to develop and promote the peaceful, nonexplosive use of atomic energy, both governments will be able to cooperate in ways not mentioned in "1," specifically in the exploration, mining and utilization of nuclear substances.

Article 1A

The cooperation between the governments of both treaty nations, as defined in the previous Article, will follow the provisions of both this agreement and related international treaties and statutes in effect for each of the

respective countries. The following conditions will prevail for cooperation as defined in Article 1c:

a. When the Japanese government or individuals appointed by it are involved, the security measures of international atomic energy organizations (hereafter called "organizations") will apply to all nuclear substances involved in all atomic energy activities performed under the supervision of the Japanese government or at any location under its jurisdiction.

b. When the government of the French Republic or individuals appointed by it are involved, the security measures of organizations will apply to all nuclear substances which are used in all nonmilitary atomic energy activities, as designated by the French government, under the supervision of the French government or at any location under its jurisdiction.

Article 2

Any materials, nuclear substances, equipment, facilities or secret technology transferred on the basis of this agreement, as well as equipment and devices based on secret technology transferred on the basis of this agreement, in addition to nuclear substances either recovered or produced as by-products, will be used for peaceful, nonexplosive purposes.

Article 2A

1. In order to ensure the fulfillment of obligations based on the provisions of Article 1, nuclear substances transferred on the basis of this agreement or recovered or produced as by-products will:

a. if under the jurisdiction of the Japanese government, come under security measures applicable to organizations and the Japanese government, based on agreements concluded between the organizations and the Japanese government concerning the implementation of Treaty Articles 1 and 4 regarding the nonproliferation of nuclear weapons; or

b. if under the jurisdiction of the government of the Republic of France, come under the security measures of applicable organizations, on the basis of agreements concluded between the organizations, the French government, and the European atomic energy community regarding applicability of security measures in France.

2. When the security measures required by "1" are not applicable in regard to substances for which international atomic energy organizations have jurisdiction with either of the governments, both governments will immediately come to agreement in order to apply measures at the same level of effect and range of application as the security measures stipulated in "1," i.e. security measure systems in compliance with the basic laws and procedures of the organizations.

Article 3

For nuclear substances transferred on the basis of this agreement and for those recovered or produced as by-products, appropriate protective measures will be maintained no less than the level provided in Appendix A of the agreement.

Article 4

1. Any materials, nuclear substances, equipment or facilities transferred under this agreeement, as well as nuclear substances recovered or produced as by-products will be passed only to individuals recognized by the appropriate government and under the jurisdiction of the receiving government.

2. Any materials, nuclear substances, and equipment transferred on the basis of this agreement, any nuclear substances obtained from nuclear substances transferred under this agreement, and any nuclear susbstances obtained through more than one or two procedures using equipment or facilities transferred under this agreement, will not be transferred or retransferred outside the jurisdiction of the receiving government, except when the receiving government receives the following guarantees through appropriate methods or when there is agreement with the supplying government when such guarantees are unobtainable:

a. [Such materials] will be used by the receiver only for peaceful, nonexplosive purposes.

b. For nuclear materials, the security measures of international atomic energy organizations will be in force for the recipient.

c. The recipient will adopt protective measures for nuclear substances at the level provided in Appendix A of this agreement.

3. The items listed below follow the provisions in "2." There will be no transfer or retransfer outside the jurisdiction of the receiving government (except to the jurisdiction of the supplying government) unless there is prior written agreement from the supplying government.

a. Equipment or facilities for enrichment, reprocessing, or heavy water production which are transferred on the basis of this agreement.

b. Heavy water, plutonium, uranium enriched to greater than 20 percent uranium 235, or isotopic elementary uranium 233 which is tranferred on the basis of this agreement.

c. Secret technology transferred on the basis of this agreement or equipment and facilities based on secret technologies transferred on the basis of this agreement.

Article 4A

1. After the effective date of the protocol modifying this agreement which was signed on 9 Apr 90 in Paris, this

agreement will be applicable for materials, nuclear substances, equipment, and facilities transferred between Japan and France from the time they enter the receiving government's jurisdiction, regardless of whether the transfer is direct or through a third country, except when the supplying government has notified the receiving government of the transfer in writing in advance.

2. This agreement will not be in force for materials, nuclear substances, equipment, and facilities covered by this agreement in the following cases:

a. When a list of applicable articles is transferred outside the jurisdiction of the receiving government following the provisions of this agreement.

b. When both governments agree on a list of applicable articles.

c. When it is determined that the nuclear materials have been quenched, that they cannot be practically reprocessed, or that they cannot be used in any atomic energy activities for which the application of organization security measures would be considered proper in accordance with provisions concerning the termination of security measures contained in agreements between Japan and international atomic energy organizations as provided in Article 2A or agreements between the French government and the European atomic energy community.

3. This agreement will be in effect for secret technologies transferred on the basis of this agreement from the time they enter the jurisdiction of the receiving government until a time determined with the mutual consent of both governments.

4. In terms of the applicability of this agreement, the secret technologies listed in Appendix B of this agreement will be regarded as having been transferred on the basis of this agreement.

Article 5 (Omitted, no change)

Article 6 (Omitted, no change)

Article 7 (Omitted, no change)

Article 7A (Omitted, Method of Resolving Disputes)

Article 8

In terms of applicability to this agreement:

a. "Equipment" refers to essential machinery, devices, or tools, or their component parts, designed or built especially for use in nuclear power designs, as listed in Part A of Appendix C of this agreement.

b. "Facilities" refers to buildings or structures designed or built especially for use in nuclear power designs.

c. "Individuals" refers to individuals, corporations or other groups (especially public and private associations, companies, and organizations) and does not include the Japanese and French governments.

d. "Public information" refers to information which has not been designated secret.

e. "Source substances" (omitted)

f. "Special fissionable substance" (omitted)

g. "Nuclear substances" (omitted)

h. "Nuclear substances which have been recovered or produced as a by-product" refers to nuclear substances obtained from nuclear substances transferred on the basis of this agreement or to substances obtained from processing using either equipment transferred on the basis of this agreement or equipment based on secret technology transferred on the basis of this agreement, or both.

i. "Materials" refers to materials used in nuclear reactors, as listed in Part B of Appendix C and does not include nuclear substances.

j. "Secret technology" refers to substantive information which is designated through the mutual consent of both governments as being important to the design, construction, operation, or maintenance of equipment or facilites for enrichment, reprocessing, or deuterium production.

k. "Equipment and facilities based on secret technology transferred on the basis of this agreement" refers to equipment and facilities in which principal components of the technology used in construction or manufacture are designated through the mutual consent of both governments to be secret technology transferred on the basis of this agreement.

Article 9

1. Except in cases where the provisions in "2" [below] apply, this agreement will be in effect for 45 years (Note: in the sense that it will be in force for 45 years after the old agreement came into effect, this means until October, 2017). Thereafter, either government can notify the other government of its intention to terminate this agreement. In this event this agreement will cease six months after such notification.

2. In the event that one government does not fulfill obligations based on provisions in Article 2, 2A, 3, or 4 or does not follow the judgement of an arbitrator as stipulated by Article 7A, the other government will have the right to demand corrective action from their counterpart government. If such corrective action has not been taken within a suitable time period, the government which has demanded corrective action will have the right to abolish this agreement by notification in writing. In the event that this agreement is abolished, either government will be able to repeal covenants made on the basis of this agreement and to demand the return of special fissionable substances which were transferred on the basis of this agreement and under the jurisdiction of the other government at that time. However, payment of current price will be considered a condition of such return.

3. In the event that this agreement is abolished or terminated, the provisions in Article 2, Article 2A, Article 3, Article 4, "2" through "4" of Article 4A, Article 7, and "2" of Article 9 will remain in effect for as long as necessary.

Article 9A

The appendices to this agreement are an unseparatable part of the agreement. With the mutual consent of both governments the appendices to this agreement can be modified without revising the agreement.

Appendix A (Omitted, Standards of Protection)

Appendix B (Definition of Secret Technologies for Retroactive Clauses)

This refers to substantive materials, as designated by the mutual consent of both governments, relating to the design, construction, and operation of the Rokkasho-mura commercial-scale reprocessing plant which were transferred from Japan to France on the basis of the 30 Apr 87 agreement between individuals appointed by the two governments, but prior to the time when its protocols became effective.

Appendix C (Omitted, the Definition of Items and Terminology Determined by the London Guidelines)

Debate Begins on Japanese-French Nuclear Cooperation Agreement

90WP0110Y Tokyo GENSHIRYOKU SANGYO SHIMBUN in Japanese 24 May 90 p 1

[Text] Discussions in the Diet on the new Japanese-French Atomic Energy Cooperation Agreement began with the 17 May plenary session of the House of Representatives. Foreign Minister Nakayama first explained the reasons behind the proposals in the new agreement. He emphasized that "it will provide one level in the legal framework leading to Japanese-French cooperation." Then in response to a question posed by N. Matsubara of the Socialist Party in opposition to the use of plutonium, Prime Minister Kaifu responded that "the use of plutonium is essential to Japan," and in addition Foreign Minister Yamanaka, Minister of International Trade and Industry Muto, and Director-General Oshima of the Science and Technology Agency all voiced their agreement and spoke of the importance of atomic energy development.

In explaining his opinion on the new Japanese-French agreement, Foreign Minister Yamanaka stated that in order to establish this first step in the legal framework of cooperation between the two countries, the agreement incorporated for the first time 1) regulations on nuclear substances protection (PP [physical protection]), 2) regulations on prior notification between governments when enriched uranium or equipment are transferred, and 3) regulations regarding secret technologies. He stressed that "[the agreement] will ensure a long-term stable basis for cooperation with France, something which is important to Japan."

In opposition, Mr. Matsubara (Socialist) pointed out that countries like Sweden and Italy have been encouraging the trend toward removing nuclear power. He questioned the government's opinions by asking why Japan is rushing to construct a private-sector reprocessing plant when favorable economics for fast breeder reactors which use plutonium have become so distant and whether or not its nuclear nonproliferation policy will really be functional. He also pointed out that "This agreement contains an important crossroads as to whether or not Japan rushes headlong to become a society dependent on plutonium."

Prime Minister Kaifu first responded by stating that "In regard to the fuel cycle question we agree with the idea that each country in the world should proceed in accordance with its own situation." Then while using the active promotion of reprocessing in Great Britain and France as an example, he emphasized that "Japan is poor in energy resources and in order to have a stable supply, the use of plutonium is absolutely essential and so we are promoting its use to ensure adequate stability."

During his tour of India and Pakistan at the end of April, the Prime Minister stated that he had "appealed to the leaders of both countries to join the nuclear nonproliferation treaty (NPT)."

Foreign Minister Yamanaka stated that "We have adequate guarantees that secret technologies exported from Japan cannot be used for military purposes by France or Third World countries. Nothing will go to countries not participating in the NPT."

Minister of International Trade and Industry Muto spoke in regard to the economics of plutonium use. He emphasized that "although I cannot state unequivocably that it will have an impact on the price of plutonium and natural or recovered uranium, the use of plutonium will allow us to work toward conserving our uranium resources and lowering our dependence on overseas resources."

Director-General Oshima pointed out the importance of the 1992 plutonium shipment from France and then in regard to the economics of plutonium, he stated, "It has been recognized that [plutonium use] is not very different from using uranium fuel by itself." He emphasized that Japan's basic policy is to reuse plutonium as a nuclear fuel.

The Director-General also explained that the amount of plutonium (fissionable) which Japan has on hand now (end of March) is 0.5 tons and anticipated demand by the year 2001 would total 42 tons: 9 tons for the Joyo, Fugen, and Monju, 4 tons for the ATR demonstration reactor (Oma), 4 tons for FBR demonstration reactor #1, and 25 tons for light water reactor use (Pu thermal).

NORTH KOREA

Article Assesses North's Nuclear Development

SK3108070690 Seoul SINDONG-A in Korean Aug 90 pp 206-215

[Article by Song Yong-son: "North Korea's Nuclear Development, the Real Intent"]

[Text] We see a steady stream of press reports on the possibility that North Korea is developing nuclear weapons. Some of our largest newspapers have reported recently that Pyongyang can develop nuclear weapons within six months or a year.

Elsewhere, Washington and Moscow display a keen interest in North Korea's capability to develop nuclear weapons. Their interest originates in the fact that North Korea's nuclear development impacts directly on the policy of Northeast Asian tension reduction pursued by both the United States and the Soviet Union.

North Korea's possession of nuclear weapons is a crucial variable which directly influences the future status of U.S. forces stationed in Korea, the improvement of relations between the Republic of Korea and the Soviet Union, and even the improvement of relations between the United States and North Korea. Why is Pyongyang continuing to develop its nuclear capability despite the fiery scowls of international society? Does North Korea in fact have the capability to develop nuclear weapons? Is the North merely trying to convey the impression that it is developing a nuclear capability? If that is what Pyongyang is doing, why are they doing it?

For the purposes of this article, we will start with the issue that first raised suspicion, the fact that Pyongyang has not signed the Nuclear Safeguards Accord.

Despite domestic and foreign pressure, especially from the United States and the Soviet Union, North Korea has not signed the Nuclear Safeguards Accord of the IAEA, the International Atomic Energy Agency. The United States and Japan, allies of the Republic of Korea, have strongly hinted that if North Korea will only conclude the accord, they will undertake to pursue momentous improvements in their relations with Pyongyang. Despite all the pressure, North Korea clings to its stubborn refusal to sign. In a recent conversation with Japanese Prime Minister Kaifu, who was attending a meeting of the G7 [Group of Seven] (the seven most developed Western states), President No Tae-u went so far as to request repeatedly that the Japanese leader do all in his power to nudge North Korea into signing the Nuclear Safeguards Accord. We will now examine the reason North Korea does not sign the Accord and the real reason Pyongyang consistently advocates that the Korean peninsula be declared a nuclear-free zone.

Pyongyang Continues To Refuse To Sign the Nuclear Safeguards Accord

The IAEA and the Nuclear Nonproliferation Treaty (NPT) originated in the early 1950s. In 1953, U.S. President Dwight D. Eisenhower began to advocate the peaceful use of atomic energy and attempted to prevent the spread of nuclear weapons. Despite his initiatives, two cases of nuclear proliferation occurred. Seizing the opportunity afforded by these cases, Eisenhower moved to bolster his policy and to create an organization dedicated to the secure use and possession of atomic energy. Headquartered in Vienna, Austria, the purpose of the IAEA is to promote the peaceful use of atomic energy and block its use for military purposes. The organization urges all countries who want to use atomic energy to sign the NPT. The IAEA prescribes that once they have signed the NPT they also conclude an agreement called the "Nuclear Safeguards Accord."

At present, 113 countries are members of the IAEA. Our country joined in August 1957, and North Korea joined in September 1974. In addition, 138 countries have signed the NPT, including virtually all those belonging to the IAEA. Seoul signed the treaty in April 1975, and Pyongyang followed suit in December 1985.

Countries which sign the NPT are obligated to accept the IAEA's atomic safety measures. One treaty related to these security measures is the Nuclear Safeguards Accord, which must be signed after a country executes the NPT. I will use the term Nuclear Safeguards Accord throughout this article. The security provisions of the Nuclear Safeguards Accord apply to the atomic power activities of all countries which do not possess nuclear weapons and have signed the NPT, as well as to all states which have signed agreements with the IAEA. A majority of the nations which have signed the NPT have signed the accord also, including the Republic of Korea. The accord amounts to an essential adjunct to the NPT itself, and countries which sign the NPT are required to sign the accord within 18 months of subscribing to the NPT.

North Korea, however, signed the NPT in December 1985 but did not execute the Accord. Despite unremitting international pressure and condemnation, as of July 1990 North Korea had not signed the Nuclear Safeguards Accord. Pyongyang's failure to sign the Accord is the major reason for suspicions that the North Koreans do not agree with the basic purposes of the NPT even though they have signed the treaty. Their failure to sign raises suspicions that they may be actively promoting a program to produce nuclear weapons.

The North Koreans appear to calculate that whether or not they actually possess nuclear weapons, the suspicions and condemnation of other states in the region actually serve to boost Pyongyang's prestige, causing it to be seen as a potential nuclear state, and as a practical matter arrogates to the North a more viable deterrent capability vis a vis the Republic of Korea. If North Korea is developing nuclear weapons, meanwhile, not signing the

Accord leaves them free from IAEA inspections and monitoring as they pursue their program. Pyongyang believes, then, that the criticism it receives for not signing the accord is more than offset by increased deterrence vis a vis the South and by the real gains it has enjoyed in its relationship with the Soviet Union and China.

North Korea maintained a consistent attitude on the matter at an IAEA directors conference held in Vienna, Austria in February 1990. Representatives of 16 of the 35 countries attending this meeting criticized North Korea for refusing to sign the Nuclear Safeguards Accord, but North Korean representative Yun Ho-chin responded by placing the following conditions on Pyongyang's possible signing of the accord. Yun demanded that these conditions be physically written into the accord as part of its text before North Korea would consider signing:

1. South Korea must remove all nuclear weapons from its territory.

2. The combined South Korea-United States military exercise "Team Spirit" must cease.

3. North Korea reserves the right to regard the Nuclear Safeguards Accord as null and void, depending upon Pyongyang's evaluation of the attitudes of countries which possess nuclear weapons.

Despite the fact that North Korea has broken a number of IAEA deadlines to sign the accord, at the meeting, the IAEA once more extended North Korea's deadline to sign, this time until June 1990. Despite even that concession, North Korea had not accepted the accord as of July 1990. Pyongyang has promised, however, to sign the accord by September. Based on their track record to date, we must wait and see whether they actually sign by that time.

Even if Pyongyang does not conclude the Nuclear Safeguards Accord, the IAEA can undertake no legal sanctions against North Korea for breaking its pledge to sign. The Nuclear Safeguards Accord is not mandatory; it derives its efficacy from willing international cooperation. Pyongyang is only too aware of this fact, and the very strong possibility is that North Korea interprets accepting the accord less as an opportunity to enhance international cooperation than as a negotiating card to be exploited in discussions about Korean Peninsular issues with China, the Soviet Union, and even with the United States.

Pyongyang's Scheme Behind Its Demands for a Denuclearized Peninsula

North Korea first raised the issue of the denuclearization of the Korean Peninsula in 1976, although not as an official government position. Their intent at that time was to focus attention on the issue of withdrawal of U.S. Forces from Korea by linking withdrawal with the broader anti-American struggle. Denuclearization as a propaganda ploy surfaced at that time, of course, because Pyongyang had signed the NPT the year before, 1975. Signing the NPT and surfacing denuclearization, in turn, were probably Pyongyang's response to a 1975 statement by South Korean President Pak Chong-hui. The United States Government was already sending signals that it might withdraw forces from Korea. Pak responded with, "If necessary, the Republic of Korea will develop nuclear weapons on our own. We have the capability to do so."

North Korea probably perceived President Pak's bombast with scepticism, but at the same time Pyongyang planners were afraid that South Korea would in fact develop a nuclear capability of its own. They may have wanted to create a theoretical basis from which North Korea could marshal international opinion and mount a strong campaign against any future move by Seoul to develop nuclear weapons.

Pyongyang's vague and general call for denuclearization of the peninsula continued as nothing more than cooperative support for the Japan Socialist Party's demands for denuclearization of Northeast Asia until the Soviet Union's "Vladivostok Statement" in the mid-1980's. It was not until 23 June 1986 that the North Korean Government officially proposed to South Korea that the Korean peninsula be denuclearized. Later, on 28 July 1986, Gorbachev said in his Vladivostok speech that, "North Korea's proposal for turning the Korean peninsula into a peace zone, free of nuclear weapons, contributes to the pursuit of peace on the Korean peninsula." Gorbachev's statement served to lend credibility to the North Korean initiative, and the notion of a nuclear free Korean peninsula began to gel from that time.

Encouraged by the statement of "support" from the Soviet Union, North Korea sponsored an "International Conference for Denuclearization and Peace on the Korean Peninsula," which was held in Pyongyang during 6-8 September 1986. North Korea continued its initiative, announcing concrete measures for denuclearization through its Foreign Ministry in July 1987. Then in 1988, the tone of North Korean denuclearization demands changed. Pyongyang dropped the usual hackneyed, uncompromising propaganda terms opposing nuclear weapons and adopted a relaxed tone that continues to characterize their arguments even today. Since 1988, they have said, "North and South Korea must adopt phased measures to remove nuclear weapons from the Korean peninsula and withdraw foreign forces as well."

Ironically enough, observers in the South failed to detect in this change what may have been a hint in Pyongyang's proposals suggesting the possibility that North Korea possessed nuclear weapons. Until 1988, the North Koreans had called for removal of nuclear weapons from the Korean peninsula only south of the 38th Parallel. Now they said "North and South." We cannot rule out the possibility that the North Koreans made this change because of the advantages they see in the U.S. Forces Korea policy neither to confirm nor deny the possession

of nuclear weapons. Indeed, it is a separate issue whether U.S. forces actually do or do not possess nuclear weapons. Refusing to confirm or deny the existence of the weapons visits a form of psychological deterrence on Pyongyang. North Korea may have decided to take a page from the same book, changing their formulation so as to create doubt about the existence of nuclear weapons in the North and gaining thereby an increased psychological deterrence over the South.

North Korea's call for denuclearization of the Korean peninsula was largely a propaganda ploy up through the end of the 1970's. Its purpose was to curry favor with the Nonaligned Movement and actually went beyond the Korean peninsula to focus on the denuclearization of Northeast Asia and indeed of the entire world. The North Koreans simply stole a free ride on the world antinuclear movement in a move calculated to broaden North Korea's international support. Their policy was largely for show. By contrast, in the 1980's the North Korean policy of peninsular denuclearization has been developed with dedicated, calculated planning.

As arms reductions talks between the United States and the Soviets progressed and as Gorbachev's idea for an Asian security structure began to take concrete form in his speech at Vladivostok, North Korea saw an opportunity to kill two birds with one stone. Pyongyang seized the moment to make its call for denuclearization explicit. This allowed the North to steal a ride on international public opinion favoring regional denuclearization, providing Pyongyang the opportunity to play the role of a peace-loving state, improving its tattered image, while at the same time the initiative allowed the North to usurp the role of peacemaker on the Korean peninsula, establishing a foundation from which to label U.S. Forces Korea to be the obstructionist element in the equation.

The North Korean position has been to claim that U.S. Forces Korea possesses nuclear weapons and that the way to obviate both the threat of nuclear war on the peninsula and to guarantee peace and security on the peninsula was to remove U.S. forces and their nuclear weapons from Korea. By the same token, North Korea's goals were to create and maintain the impression that the threat of nuclear war on the peninsula and the responsibility for increased tension there lay with the Republic of Korea and the United States of America. This allowed Pyongyang to heighten anti-South Korean and anti-American sentiment internationally as well as boost anti-Americanism within South Korea.

Circumstantial evidence appearing in many channels suggests that North Korea is itself pursuing the development of nuclear weapons. This tends, of course, to give the lie to their embrace of regional denuclearization, and Pyongyang's espousal of regional denuclearization now appears to be nothing more than calculated propaganda.

The Nucleus Is the Nuclear Reactor at Yongbyon

To analyze North Korea's capability to develop nuclear weapons, we must look at three broad areas of concern: first, physical items necessary for nuclear development; second, North Korea's domestic and international orientation; and third, the intent of the North Korean leadership to develop nuclear weapons.

In addressing the physical items required for nuclear development, we must review carefully the characteristics of North Korean nuclear reactors, whether for research or for the generation of electricity; Pyongyang's enrichment technology; their reprocessing technology and related facilities; personnel resources; and their economic capacity. In addressing their domestic and international orientation, we must review North Korea's advantages militarily and in its international relations. Finally, in addressing the intent of the North Korean leadership to develop nuclear weapons, we must understand that this variable provides the most direct and positive insight into the question of whether North Korea actually is pursuing nuclear weapons development.

The nuclear field can be broadly partitioned between atomic energy and nuclear bombs. In certain forms of matter like uranium or plutonium, atoms may be bombarded by neutrons in such a way as to divide the atoms of the original substance. As atoms of the original material break up, neutrons are jarred out of their atomic orbit. As neutrons spin out of the original atoms, they split other atoms, which then lose neutrons which smash still more atoms, and so on in a nuclear chain reaction called fission. As the process of fission occurs, enormous amounts of nuclear energy are released spontaneously and the mass explodes instantaneously. This is a simplified depiction of a nuclear bomb.

Only about three to 10 percent of the low-enriched uranium fuel used to generate electricity is actually consumed in the process, whereas nuclear weapons consume more than 90 percent of the highly concentrated uranium or plutonium used in weapons. The problem associated with the proliferation of nuclear weapons is that a country with sufficient technology and will can exploit the atomic fuel that remains intact after power generation to make nuclear bombs. The North Koreans may have precisely the technology and the will to pursue a nuclear weapons development program that can emerge as an extreme threat to the security of the Korean peninsula. We will first examine the nuclear fuel reprocessing technology and facilities necessary for North Korea to produce either the plutonium or sufficiently enriched uranium requisite to the development of nuclear weapons.

A nuclear reactor is a device designed to split atoms of enriched uranium to release energy. There are three types of reactors: research reactors; military reactors, which produce plutonium; and industrial reactors, which generate electricity. Relying on all available data, North

Korea seems to have installed reactors at four different sites. Reactor One, Reactor Two, and Reactor Three are located at Yongbyon, and the fourth reactor is at Sinpo in North Hamgyong Province. We can rule out the Sinpo reactor as a possible factor in Pyongyang's capability to produce nuclear weapons because the Sinpo plant is used to generate electric power. There is some doubt as to whether Reactor Three at Yongbyon is operational. The original schedule called for completion by the end of 1990.

Of the remaining two reactors, Yongbyon's Reactor One was completed in 1965 with Soviet technical support, while Reactor Two at Yongbyon is essentially a copy of the French G-1 model built with North Korean technology and completed in late 1986. The reactor was used by the French in the early 1960's for the development of nuclear weapons before being removed from that program and devoted strictly to the production of plutonium.

It is believed, however, that North Korea uses Reactor Two, which began operating in the spring of 1987, as the heart of its nuclear weapons development program. Located at Yongbyon some 100 kilometers north of Pyongyang, Reactor Two has a maximum rated capacity of 20 megawatts. Thus, the reactor can produce six to eight kilograms of plutonium yearly. At this rate, Reactor Two would need two years to produce the plutonium needed to manufacture a 20-kiloton class nuclear weapon. A 20-kiloton class device has roughly the same explosive power as the weapon that was dropped on Nagasaki in 1945. In point of fact, however, North Korea readily could make a much bigger bomb. Although a higher degree of technical sophistication is required to produce a 100-kiloton class nuclear warhead, the 100-kiloton device requires only a few dozen kilograms of plutonium. American satellite photography reveals a structure estimated to be a nuclear reprocessing facility located near Reactor Two at Yongbyon.

North Korea Unlikely To Produce Nuclear Weapons Within Six Months

Reactor Three was begun in 1985 and is scheduled for completion by the end of 1990. Reactor Three also was built by the North Koreans, working without aid from either the Soviet Union or East Europe. Because Reactor Three has significantly more plutonium production capacity than Reactor Two, if Reactor Three is used for weapons manufacture when it comes on line, then Reactor Three will present an absolute order of threat to the security of the Republic of Korea. Two crucial points need to be kept in mind. Both Reactor Two and Reactor Three were built with North Korean technology, and both can use as fuel the natural uranium produced in North Korea.

This means that the North Koreans will be able to manage the nuclear fuel cycle completely on their own. The nuclear fuel cycle starts with mining natural uranium ore. The ore is run through refining and enriching processes to produce nuclear fuel. Once the fuel has been depleted as part of a nuclear reaction in a reactor, it can be discarded or it can be stored and reprocessed. This cycle in North Korea is not susceptible to inspection or intervention by either the IAEA or the Soviet Union. The control of the cycle exercised by the North Koreans provides an environment in which nuclear weapons can be developed in complete secrecy.

Once fuel has been depleted in a reactor, a separate facility is necessary to extract plutonium from the spent fuel. Although the media have asserted since June 1989 that such a facility has been observed in North Korea, in point of fact we cannot say with certainty that this is true. Thus, recent reports that North Korea is capable of producing nuclear weapons within six months can be true only if North Korea has completed construction of reprocessing facilities, and these facilities are completely operational. The American nuclear experts who visited Korea in June 1989 said that North Korea had constructed a nuclear fuse test site near Yongbyon. The American statement was reflected in domestic press reports at the time that North Korea was testing nuclear fuses. This evidence is sufficient to suggest that North Korea is doing basic testing related to nuclear weapons design.

Nonetheless, there is no reason to assume that the North Koreans can produce nuclear weapons within six months just because they possess a nuclear fuse testing site. Before we believe that North Korea can produce nuclear weapons within six months, we must have much more corroborating data. Were Pyongyang to produce nuclear weapons that fast, it would require an emergency national effort to reduce appreciably the absolute amounts of time required to produce nuclear weapons. In other words, the weapons production process is composed of phases or stages which cannot easily be skipped. The first phase is going from the idea to produce weapons to basic design; from basic design to basic testing; from basic testing to acquisition of weapons-grade, fissionable material; from material acquisition to actual nuclear weapons design; from design to producing a model weapon; and from model weapons to actual production of nuclear weapons.

For the recent assertions that North Korea can produce nuclear weapons within six months to be correct, we would have to see evidence that Pyongyang was far enough along in the course of nuclear weapons development to have successfully produced and tested a model weapon.

Not only do we have no such evidence, in fact we have no way of knowing even whether North Korea has obtained weapons-grade, fissionable materials in sufficient quantities to produce nuclear weapons. Moreover, we do not know with certainty, as foreign experts assert, that Pyongyang can shortly bring reprocessing facilities on line. Although a number of sources suggest that North Korea is doing initial, nuclear-related testing, no certain evidence exists to suggest that the North has completed

the sophisticated nuclear testing that requires accuracy levels reaching one million to one. Based on present information, then, it is difficult to assert that it is possible for North Korea to develop nuclear weapons now or within six months' time.

3,000 North Koreans Engaged in Nuclear Development

Next we shall examine the issue from the viewpoints of economics and human resources. It is known that North Korea at present has a total of 3,000 scientists and others working on nuclear development, of whom about 150 possess doctoral degrees. This investment of human resources is sufficient for the task of developing nuclear weapons. North Korea also sends 30 persons each year for training at the Soviet Union's Dvuna [name as published] Institute. Moreover, North Korea sustains a tremendous educational commitment to the nuclear field, operating departments related to nuclear matters at Kim Il-song University and other key educational institutions.

North Korean uranium reserves exceed several million tons, and although the purity of the uranium is quite low, it can be used for nuclear fuel. Sources say that the North Koreans have built at Hwangsan in North Pyongan Province all the necessary facilities for refining, converting, and processing the uranium. Sources also say they are building a nuclear fuel reprocessing plant as well. The mining and refining facilities and the fuel processing facilities are already in place to allow the North to pursue successfully an assumed goal of building ten nuclear bombs, each in the 20-kiloton class and assuming plutonium to be the fissionable material of choice.

Economically, 203 million dollars is estimated to be sufficient for reprocessing, design and manufacture, and testing and evaluation—but excluding the cost of reactors. This sum is not a heavy burden, and amounts to only one-half of one percent of Pyongyang's estimated military budget from 1987 to 1995.

North Korea's domestic and international orientation on the issue of nuclear weapons development amounts to an analysis of their military and foreign relations advantages. From the military standpoint, North Korea seems to have calculated that their independent development of nuclear weapons will result in a local balance of nuclear terror on the Korean peninsula even if U.S. forces in Korea possesses nuclear weapons. Pyongyang thus believes that when U.S. forces leave Korea their own possession of nuclear weapons will put them in an absolutely superior military position vis-a-vis South Korea.

North Korea is pushing the development of nuclear weapons on the assumption that eventually they will be the only power on the peninsula with nuclear weapons and will be positioned to use nuclear blackmail to gain an advantageous bargaining position vis-a-vis South Korea. Experts now predict that the expansion of the South Korean military will result in Seoul catching up with the North and achieving a military balance by the mid-1990's. Faced with this eventuality, the most attractive response available to the North Koreans is the development of nuclear weapons. North Korean planners believe that developing nuclear weapons will provide them a means to offset their looming loss of military superiority relative to South Korea. Their loss of superiority will be forced upon them by the ineluctable results of the superior South Korean economy and by the unavoidable aging of their own conventional military establishment.

Seen in the international context, Pyongyang's development of nuclear weapons, even if these prove to be of relatively inconsequential size, will result in a significant jump in North Korea's international prestige, if only because the world remains in awe of the terrible destructive force of the bomb. Northern planners see developing nuclear weapons as a dramatic short cut to ethereal levels of international prestige. Pyongyang's possession of nuclear weapons will cause both the Soviet Union and China to give North Korea much more respect, the respect and prestige due to a member of the nuclear club. Moreover, Pyongyang will be able to exploit its possession of nuclear weapons as a lever to pry military assistance from both Moscow and Beijing.

Other international advantages to developing nuclear weapons will include increased clout in bargaining for the withdrawal of U.S. forces from Korea. Pyongyang will be able to play its nuclear card. Even if South Korea also develops nuclear weapons, North Korea probably will believe that their development of nuclear weapons was a positive move, one which allowed a "local balance of nuclear terror" to develop and which will lead ultimately to peace on the peninsula.

Finally, North Korea is likely to maintain a nuclear arms development program because the compensation to Pyongyang for decreasing its military dependence on Moscow amid a rapidly changing international arena, however painful the process, will be the option to reduce reliance on the Soviet Union, opening the door to increased independence of action.

North Korean Leadership's Intentions a Major Variable

Finally, let us examine North Korea's nuclear development from the standpoint of its leaders' intentions. Some analysts support the simple argument that North Korea would not have signed the NPT or joined the IAEA had it really intended to begin a nuclear arms development program. This argument is nothing more than an expression of doubt about North Korea's intent to develop nuclear weapons. Such an argument amounts to holding that a North Korea which criticizes U.S. forces in Korea for possessing nuclear weapons and which so strongly advocates the denuclearization of the Korean peninsula simply could not adopt the self-contradictory attitude necessary to develop nuclear weapons on her own. Other analysts believe that economic realities and the level of

technical development in North Korea relegate possible development of nuclear weapons by Pyongyang to the remote future.

Others argue that North Korea is not inhibited from producing nuclear arms by either economic considerations or by deficient technical expertise, but rather is inhibited by the fact that any potential gains in international prestige would be more than offset by damage to North Korea's relations with its surrounding states and with the superpowers. These observers argue that this is sufficient reason to prevent North Korea from developing nuclear weapons.

Similarly, certain observers believe North Korea's need to build nuclear weapons is offset by problems the regime will face in the process. That is, even if we assume that Pyongyang would not find it difficult to develop nuclear weapons with existing economic and technical wherewithal, the North would encounter a daunting array of problems should it undertake such a project. North Korea's independent development of nuclear weapons in the midst of a mood of world neodetente would only make matters worse for Pyongyang. An already isolated North Korea would become even more isolated. A nuclear weapons program would cause Pyongyang more loss than gain in regard to maintaining and improving relations with its existing allies, even if such a program did not elicit the hard-eyed interest of the superpowers.

Above all, these voices say, should North Korea arm itself with nuclear weapons at a time when a strong neodetente current is coursing through the world community, the result could be even greater tension on the Korean peninsula. Choosing the nuclear path could well force South Korea to begin its own nuclear weapons development program or push Washington and Seoul closer militarily, to Pyongyang's own detriment.

Some observers believe that should North Korea develop nuclear weapons, Pyongyang would be giving the lie to its own efforts over the last 15 years on behalf of denuclearization of the Korean peninsula, of Northeast Asia, of Asia, and even the whole world.

However convincing some of these arguments may be to us, Kim Il-song lives in a different factual environment, in his own world, as any number of historical examples reveal. International public opinion has no great impact on Kim Il-song. In view of this fact, then, whatever the international political situation may be at any given moment, the North Koreans are virtually certain to pursue nuclear weapons development with little regard for the opinions of the superpowers or for international society in general, provided only that Kim Il-song clings to his intentions.

Even if North Korea develops nuclear weapons, of course, it is quite another question as to whether Pyongyang would ever use them against its blood kin in the South. North Korea's basic national policy remains the communization of South Korea. Some argue, however, that Pyongyang is simply not about to use nuclear weapons to reduce Seoul to a garbage dump. The same people often use the same grounds to ridicule the idea that North Korea may have a nuclear weapons development program.

Many sources, however, have made it clear a very considerable basis exists for arguing that North Korea is no paper tiger when it comes to developing nuclear weapons, weapons which it sees as key to establishing itself as the future supreme military power on the Korean peninsula and as key to applying a valid threat to South Korea.

Estimates vary from six months from now to five years from now for the time when Pyongyang will actually produce nuclear weapons. When U.S. forces withdraw from Korea, our response to Pyongyang's possible production of nuclear weapons will be the possible establishment of a local balance of nuclear terror on the Korean peninsula by undertaking our own program to develop nuclear weapons. Until then, North Korea's development of nuclear weapons presents us with a significant threat to our security, and in a larger sense it acts to shake the very foundations of peace on the Korean peninsula.

Of course, an absolute amount of time is required to develop nuclear weapons: time to obtain nuclear material, to enrich and reprocess it, to design nuclear weapons, test them, produce them, develop transport means for them, and deploy them. We must not forget that North Korea's unique political system and its isolation from international society may well serve to solidify Pyongyang's intention to produce nuclear weapons. These same factors also may act to spur the North to a maximal effort to decrease the time required to produce nuclear weapons. Should that happen, then Pyongyang could produce nuclear weapons anytime from six months from now to two years from now.

THAILAND

Source Comments on Nuclear Energy Possibilities

90WP0147A Bangkok SIAM RAT SAPDA WICHAN in Thai 22-28 Jul 90 pp 5-7

[Excerpts] [passage omitted] The plan to build a nuclear power plant is being discussed once again. [passage omitted]

In Thailand, this plan had been discarded. But during the past one to two years, the Electricity Generating Authority of Thailand [EGAT] has been ordered to again study the nuclear power plant program. This stems from the growth of the country.

A nuclear expert told SAPDA WICHAN that those who are in favor of building such power plants must answer the following questions:

1. Are we prepared in terms of personnel?

2. Who will guarantee that the radioactivity emitted by the nuclear power plants won't affect the quality of our air and water?

3. Once the reactor is no longer operational, will it be possible to remove it safely? And if the reactor can't be moved, how long will the area around the nuclear power plant have to be closed?

4. Who will collect the radioactive waste from the nuclear fuel after the nuclear fuel has been renewed, the seller of the fuel or Thailand? If Thailand, where will we store it?

"Thailand is interested in a high temperature reactor such as the Pebble Bed High Temperature Reactor, which is being tested in Germany. This has been designed as a very safe reactor. But it will probably be several years before it is approved and put on the market," said this expert.

It is thought that one of the areas that is being considered as a possible site for a nuclear power plant is along the Mekong River. It will probably take 12 years to build the plant and put it into operation.

The same news source added that building a power plant is not an easy task. Besides the manpower issue discussed above, the selection of a site is very important. These plants can't be built in an earthquake zone or in areas subject to flooding. And they can't be located in hurricane zones. It takes several years to study these things. And steps must be taken to ensure that the plants don't affect the environment.

"It must be admitted that an accident could happen. And if an accident does happen, the effects must be minimized as much as possible, and no one will be able to live in the surrounding area. Comparative studies must be done to determine how much radioactivity is present in the water and air in an area when there is no nuclear power plant there and when there is such a plant in the area. Have such studies been done yet?" he said.

Besides this, in the past, the cost of producing nuclear energy was lower than that of producing electricity using oil. But that is no longer true. Moreover, it costs several tens of billions of baht to build a nuclear power plant. We may have to borrow money from abroad, which could affect our ability to borrow money for other projects.

"The United States is no longer building nuclear power plants. Neither is Germany. France, however, continues to build such plants," said the news source.

We will have to watch and see how successful EGAT's public relations plan is, because even the plan to build a dam to generate hydroelectric power caused a public outcry. And in building a nuclear power plant, just the word "nuclear" generates great fear among people.

It isn't known how long it will take to "clear" this.

CZECHOSLOVAKIA

Country Objects to Criticism of Nuclear Policy

AU1909084890 Vienna DIE PRESSE in German 19 Sep 90 p 2

[APA, "hs" report: "CSFR Nuclear Criticism of Vienna"]

[Excerpt] Vienna—On Tuesday [18 September] Karel Wagner, chairman of the CSFR Nuclear Energy Commission, came down harshly on Austria's critcism of the use of nuclear energy in the CSFR. On the fringe of the general conference of the International Atomic Energy Agency (IAEA) in Vienna, he said that Austria does not have the right to demand that foreign nuclear power plants be closed down. At the same time, he warned Vienna of international isolation because of its current antinuclear policy. He compared Marilies Flemming's [Austrian minister of environmental protection] call on the IAEA to cease its activities concerning nuclear energy with "a call on doctors not to care for sick people." [passage omitted]

Safety of Jaslovske Bohunice Reactor Questioned

90CH0282A Bratislava NOVE SLOVO in Slovak 14 Jun 90 p 4

[Interview with Jiri Beranek, Czechoslovak Atomic Energy Commission expert, by Vlastimil Svoboda; place and date not given: "Warnings About V-1"—first paragraph is NOVE SLOVO introduction]

[Text] The mass media recently carried conflicting reports. The Czechoslovak Atomic Energy Commission (CSKAE) announced that the V-1 reactor at Jaslovske Bohunice is the weakest link in our nuclear power program. The Federal Ministry of Fuel and Power announced that the V-1 power plant will be operable at least until the end of the millennium.

[Svoboda] What is going on here? What is the status of this power plant in the middle of its useful life? These are the questions we put to CSKAE expert Jiri Beranek.

[Beranek] The problem is neither simple nor clear-cut. One must understand that although the power plant began operations in 1978-80, it was based on a Soviet design that was ten years old at that time. This means that its design and safety features conform to the standards of the late 1960's and early 1970's. At this time the greatest emphasis was placed on preventing core failures. A second safety consideration, namely minimizing any accidents and confining their consequences, was not a major consideration at that time. Prevention was supposed to be assured by rigid quality control when manufacturing the components and strict standards for operating critical equipment. The pressurized components of the primary circuit of the plant, however, were manufactured at a time when the USSR had not implemented the latest quality control regulations. For one thing we have almost no documentation from the production process. In terms of minimizing an accident these units are equipped to handle only the escape of small amounts of coolant. In other words, this generation of nuclear power equipment is obsolete in both design and manufacture. We should either shut it down or completely rebuild it.

[Svoboda] Your opinions clearly are in accord with those of most of the Slovak public, but would you mind explaining them in more detail for our readers.

[Beranek] Imagine the value one in 10,000. This is the probability of significant damage to the nuclear fuel in this type of reactor, 14 of which are currently operating in Europe. In other words, an accident of this type is likely to occur once in 10,000 years of aggregate operating hours. Is this a large probability or a small one? There is probably no objective answer to this question. The fact of the matter is that current reactor designs provide margins of safety greater than this by a factor of two or three. We have to achieve these levels of safety.

[Svoboda] Nevertheless there are people, especially in positions of responsibility in the fuel and power sector, which operates the power plant, that the current level of safety at the V-1 reactor is adequate...

[Beranek] There is one answer to this view. As I stated before these are only hypothetical values. The reality of V-1 is something else. We must be certain.

[Svoboda] Worse? Operations have been very smooth....

[Beranek] This is due to the excellent qualifications of the plant operators. The condition of the equipment, however, does not hold much promise for the future. Because we do not have detailed production documentation of the pressurized components of the primary circuit the time is coming when the operators will not be able to carry out established maintenance procedures. Above all the operators do not have a complete overview of the condition of the main circulation pipes for reactor coolant. Since the reactor began operations we have been testing only 27 of the 52 required locations on the external surface. There is no information on how the pipes look internally.

[Svoboda] Does this mean that the operator has not been conducting the inspection program that it originally agreed to?

[Beranek] The inspection points are not accessible, and we do not have the necessary equipment. We also have to develop a technique for cleaning the internal surfaces of the main circulation pipes.

[Svoboda] Could you reveal to us the real condition of both units?

[Beranek] A set of essential technical information is not available. We do know with considerable certainty, though, and it increases our fears, that there is an uncorrectable hydraulic pulsation in the first unit that is

placing a still greater load on the primary circuit. The second unit suffers from a lower quality reactor pressure vessel.

[Svoboda] Experts frequently cite significant seismic activity in the vicinity of Jaslovske Bohunice. What are the facts? Did the design account for this?

[Beranek] Roughly once a century this area experiences an earthquake measuring 4.2-5.0 on the Richter scale (author's note: At this intensity, factory smokestacks collapse and buildings sustain serious damage). The reactor was designed, however, to withstand quakes measuring only 2.8-3.5 on the Richter scale. This was the recommendation of a panel of experts at the Slovak Academy of Sciences at the end of the 1960's. Only when it was too late did we learn that the threat of temblors in this area is substantially greater.

[Svoboda] How long have you been calling attention to this situation? Why wasn't something done immediately?

[Beranek] Four years. Three years ago the Federal Government took up the question of V-1 power plant safety and directed the fuel and power sector, in conjunction with the CSKAE, to obtain from our Soviet partner an evaluation of the current safety of the reactor and information concerning projected impacts of a proposed rebuild. This directive has still not been carried out. The State Inspectorate did not have the legal means to force either the minister, the deputy chairman of the government, or the chairman of the CSKAE to carry out the government resolution, and has not spoken out on these problems as it should have in many instances.

[Svoboda] You have mentioned rebuilding the reactor. Is that at all feasible? How much would it cost?

[Beranek] Both reactors, if they are to conform to current European safety standards, have to be outfitted with emergency cooling systems and an enclosed space, a so-called containment building, designed to handle pressure conditions resulting from a break 500 millimeters in diameter in the main circulation pipes. Even if we decided to proceed with reconstruction, which would cost over Kcs4 billion, or more than 60 percent of the total cost of the reactors, the project is not feasible either technically or from a construction viewpoint. This was the opinion of experts from the FRG, who examined similar reactors in the GDR. Nor have Soviet designers yet come up with a feasible solution.

[Svoboda] So there is no alternative to shutting down the reactors?

[Beranek] This is the only sensible solution, but there is no need, figuratively speaking, to do so tomorrow. Both units are operating under special operating regulations. This means that both the operator and the manufacturer are conducting increased numbers of inspections. The State Inspectorate evaluates both units at the site every year, in four year cycles. The subsequent construction of a seismic protection system for the power plant has also helped matters. The CSKAE has recommended shutting it down almost completely once the first two units of the power plant at Mochovce have begun operating. This approach is in full accordance with foreign practices. Currently almost 30 reactors of a comparable technical sophistication are operating worldwide. The fuel and power sector does not want to accept this recommendation, however. In its view, the power plant should still be operating at the beginning the next millennium.

[Svoboda] How can we resolve this problem of a conflict between two high level offices. Which one will prevail?

[Beranek] The final evaluation of the situation at the V-1 power plant should not be influenced by any individual, group, or sectoral interests. Neither the economy or national economic needs should be allowed to take precedence over safety, as was frequently the case in the past when the CPCZ [Czechoslovak Communist Party] Central Committee had the final say. The situation is made somewhat easier by the fact that the reactor was very inexpensive and has already paid for itself. Nor can its good operating record be overestimated. The consequences of a break in this record could be tragic. A 500-millimeter break in the main circulation pipes caused by materials fatigue, a hidden fault, or an earthquake would, because of inadequate emergency cooling, cause a partial meltdown of the fuel elements and the escape of radioactivity into the atmosphere. Bratislava and Vienna could both be threatened depending on the weather conditions at the time.

[Svoboda] In conclusion permit me to ask you a personal question: Why, 20 years ago, did you as the representative of the CSKAE agree to the construction of the V-1 power plant?

[Beranek] If the plant had been built to incorporate the basic nuclear safety features proposed by leading Czechoslovak experts and approved in 1970 by the Federal Government presidium, the plant would have conformed to the strictest standards of the time, thereby making it more technically acceptable. At that time we were not aware of the relatively great seismicity of the location. The inspections prior to starting up the V-1 plant were conducted by the State Inspectorate at the highest levels of professional conscientiousness. After that, however, the situation changed and no account was taken of the demands of the state inspectors. For this reason we have been trying to warn people for several years now of the dangers posed by Jaslovske Bohunice. We consider it our moral responsibility.

ROMANIA

Efforts To Acquire Spanish Nuclear Facility Alleged

90WP0136A West Berlin DIE TAGESZEITUNG in German 24 Jul 90 p 9

[Article by Nikolas Marten: "Romania Wants To Purchase Spanish Nuclear Power Plant Ruin"]

[Text] Spain's nuclear industry is getting no peace. After the "almost super-GAU [worst conceivable accident]" at the Catalonian Vandellos 1 nuclear power plant in October 1989 revealed countless instances of shoddiness and criminal negligence, as well as things as drastic as illegal exports of plutonium 239 for France's nuclear forces, suspicion is now growing that at least portions of the Basque Lemoniz nuclear power plant are to be illegally sold to Romania to equip Ceaucescu's former prestige project, the Cernovoda large-scale nuclear power plant.

Even the construction of Lemoniz, situated on the Bay of Biscay near the little beach resort inlet of Bisordas, generated stiff resistance in the late 1970's. Five workers at the nuclear power plant were killed in a number of attacks, and seven militant ETA activists and an ecologist lost their lives in conflicts with the authorities. The struggle of neighbors, citizen initiative groups, and the ETA against the 640-megawatt power plant is still considered today to be the first great and bloody altercation of the post-Franco era between state authority and the populace. The construction of the nuclear plant, which was unpopular not only in Basque country, provided the ETA with justification for its deadly attacks on members of the Guardia Civil.

After the nuclear generator had been completed in 1984 at the equivalent cost of DM470 million, the national nuclear safety authority CSN (Nuclear Safety Council) responded to continuing threats to life by the ETA with an operational moratorium. Up to that point, Lemoniz had not been permitted to produce so much as a single kilowatt of electricity—not even on a trial basis. At the time, the government justified its negative decision—and not without cause—by citing "serious planning deficiencies" and "mistakes in the safety systems." Despite repeated intervention and three appeals of the government's "no," the operating company, Iberduero, had to write off its nuclear plant as a bad investment.

Change of scene to Romania 1979: Three hard winters in succession had consumed the enegy reserves—meager in any case—of the oppressed nation. The 15-watt bulb was established by decree as the maximum living room light fixture; outages and electricity rationing have remained common practice to this day. Credits for equipment were squandered, and urgently needed coal and oil were exported to "friendly" countries abroad for hard-currency earnings—a classic knockout punch for the supply of electricity to the domestic market.

It was at this time that the regime got the glorious idea of lessening its energy shortfall by building a gigantic nuclear power installation. The Canadian Government extended $3 million in credits to the dictator, and three large multinational companies—Aecl (Canada), General Electric (United States), and Ansalso (Italy)—began with the implementation of the mammoth undertaking. The goal for the Cernovoda site was five power generating units with a total capacity of 12,000 megawatts per year. In the early 1980's, however, the leader lost interest in his nuclear toy and, as Energy Minister Valeriu Popa reported in May of this year, used the rest of the Canadian construction money to pay interest on Western credits coming due.

Work at Cernovoda rested until early 1988, when domestic political danger signals caused Nicolae Ceaucescu to resume construction at a forced tempo. What is more, instead of the planned 5,000 workers, 18,000 were now toiling at the huge construction site. Valeriu Popa confirmed to a U.S. journalist that the people had to work under degrading conditions: "Not only were food and living and sleeping accommodations lacking, but everything was lacking." But he remained silent about something that is gradually coming out: Spanish companies have been involved in the nuclear business since 1988. As early as this spring, the American insider magazine, NUCLEAR WEEK, had speculated about a Hispano-Romanian nuclear connection. A high-powered industrial consortium of at least seven Spanish enterprises was formed under the name of "Energrup." In addition to microelectronics and cable electronics companies, such as Conelec and Elecnor, Reinosa Steel Mills, and San Miguel's specialty workshops, the technology and know-how of the nuclear power plant pipe and value manufacturer NPS and of the nuclear firms Equipos Nucleares, SA, and Sener were of greatest interest to the Romanian nuclear power plant designers. The change in the government was also convenient for the Iberian dealers in nuclear equipment, though they had been supplying and installing materials on the COCOM (Coordination Committee for Strategic Trade Controls) list—that is, banned for export to East Bloc countries—for years. Angel Jaurgegui, chief coordinator of Energrup, lamented in this regard: "Late last year we were about to throw in the towel because everything depended on the daily whim of one person."

But the overthrow of the Ceausescu regime and the days of revolution halted work on the hermetically sealed installation only briefly. Already in late January the Romanian Revolutionary Council, not yet legitimized by elections, once again raised the starting flag for continuation of the construction work: The first two reactor units, financed with Canadian money, immediately were granted operating licenses, and the contract for completion of the remaining three was let. "For us, nuclear energy is the sole solution, in spite of the dangers and accidents such as occurred at Chernobyl," explains Dan Grecu, science secretary at the Romanian Nuclear Energy Institute. In a 29 May 1990 article, the Madrid

daily newspaper EL SOL cited "reliable Romanian Government circles," in reporting that the U.S. company, General Electric, which was also involved in the construction of Cernovoda, had allegedly recommened "a visit to Spain" to the Romanians, because there "there was an opportunity, unique in the world, to obtain a completely installed nuclear facility." True, Lemoniz had no "operating experience," but the controversial nuclear power plant was "in exceptional condition." Energy Minister Popa thereupon expressed official "Romanian interest" on the part of the government during an interview in mid-June, despite the fact that that kind of technology transfer is illegal.

The jubilation on the part of the Spanish partners is now understandable. "We can earn billions (DM16.4 million)" Angel Jauregui exults: "If we sell everything that is available, there will be work and orders for our company for years." The man from Energrup should know since he had already held preliminary discussions in May with government representatives and nuclear engineers in Bucharest on the subject of the sale of the Basque reactor. There was an additional meeting in Bilbao during the first week in July in which Romanians, representatives of Energrup, and a representative of the proprietor of Lemoniz, Iberduero, again participated.

Jauregui regards the "Romanian nuclear project" as the "most ambitious in the world." Cheerfully, he prattles on: "Every part of the nuclear plant that can be disassembled—from electrodes, to valves, to complete turbine installations—is interesting to the Romanians." The happy huckster does not want to brood about legal problems: After all, the way the "mood" is today, "the world" should be "thankful" that the "Romanians are being helped in such an uncomplicated manner." Official spokesmen for Iberduero are more circumspect in that regard. When talking to the Basque daily newspaper, EGIN, they denied "any knowledge" of a "business partnership" with the Romanian Government. They further denied that Lemoniz was up for "sale," and they claimed "never to have heard of" a person named Angel Jauregui.

For another example of an East-West nuclear deal: "The CSFR and the Nuclear Power Plants," DIE TAGESZEITUNG, 22 July, p. 9.

BRAZIL

U.S. Release of Rocket Motor Casings Reported

PY0909011090 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 8 Sep 90 p 9

[Report by Paulo Sotero]

[Text] Washington—After President Collor de Mello blew his top, the U.S. Government a few days ago released for shipment to Brazil seven rocket motor casings belonging to the Aerospace Technology Center [CTA]. The casings had been held in Chicago since May. However, Washington suspended the license that it had granted authorizing thermal treatment of this sort of equipment in the future.

This issue, which prompted Itamaraty to harshly protest to U.S. Ambassador in Brazil Richard Melton, has caused serious tension between the U.S. Department of State and the Pentagon. Furthermore, it could not have come at a worse time for Washington. At the very time when Washington is trying to mobilize the world against Saddam Husayn, the controversy over the Brazilian rockets has placed the Bush administration in a very embarrassing position because of the well-known links that past Brazilian Governments and retired Brazilian Air Force [FAB] officers have to the Iraqi missile program.

The State Department, which approved the release of the parts for shipment to Brazil, avoided commenting on the matter yesterday after its decision was made public by THE NEW YORK TIMES. However, an official source emphasized that the Brazilian rocket casings had nothing at all to do with the Iraqi crisis or the comings and goings of Brigadier Hugo Piva, the leader of former FAB officers at the service of Husayn. Over the last few weeks, U.S. diplomats have been telling O ESTADO DE SAO PAULO that the Brazilian Government seriously intends to participate in the embargo against Iraq.

The released components are part of the Brazilian space program. They had been sent to the Lindberg Engineering company for thermal treatment, which cannot be done in Brazil. These components are steel casings of a three-stage rocket that the CTA plans to begin testing in three years. Since missile technology is involved, the service had to be previously authorized by the U.S. Government.

In June, Lindberg Engineering informed the Brazilian Aeronautic Commission in Washington that the cooking of the components had been completed but that the components could not be shipped to Brazil because the U.S. Government had decided to review the license in keeping with the nuclear nonproliferation policy and the terms of the Missile Technology Control Regime (MTCR).

Several weeks of fruitless negotiations followed. The Brazilian Government argued that the rocket casings belonged to Brazil and should be returned irrespective of whether licenses were granted in the future. Meanwhile, the U.S. Government continued procrastinating, an attitude that implied questioning Brazil's official statement that the equipment in question was to be used for the Brazilian space program only.

According to a diplomatic source, two weeks after O ESTADO DE SAO PAULO made the problem public, President Collor took a hand in the matter. An official source who knew the story told O ESTADO DE SAO PAULO: "He got very mad at the way the North Americans were handling the matter, and he basically ordered that Washington be told that we are not a bunch of kids."

THE NEW YORK TIMES reported yesterday that the U.S. decision to release the casings was severly criticized by Gary Milhollin of the Wisconsin Projects for Nuclear Arms Control. "We should not export such items to countries like Brazil," Milhollin said. He believes that supplying rocket components to Brazil "is tantamount to giving missile technology to Iraq," and he mentioned the cooperation in this field between the two countries, cooperation that Brasilia denies.

Verification System Negotiated With Argentina

90WP0158B Sao Paulo FOLHA DE SAO PAULO in Portuguese 1 Sep 90 p A-5

[Text] The Governments of Brazil and Argentina are negotiating the establishment of a mutual verification system for activities in the field of nuclear development. The understandings are part of the integration process between the two countries. Yesterday Brazilian and Argentine representatives concluded their eighth meeting on the nuclear issue at Itamaraty.

The idea is to devise a system whereby each country can monitor the other's nuclear development, and verify whether this energy might be used for military purposes.

The contacts between Brazil and Argentina have not yet reached the point of technical details on the nature of the verification system. For the present, the negotiations are of a political type. The foreign minister, Francisco Rezek, has already declared that Latin America as a whole should create mutual mechanisms for nuclear verification.

The Brazilian Government wants an eventual accord with Argentina to follow the terms of the Tlatelolco accord, which bans nuclear experiments for military purposes in Latin America.

Brazil has already signed and ratified the accord. Argentina has only signed it, but the text is not yet in effect because it requires ratification by other countries, such as Cuba and France (in the name of French Guiana).

Just as in the case of the Latin American integration process as a whole, Brazil is giving priority to the negotiations with Argentina in the nuclear energy field as

well. At Itamaraty, the negotiations on mutual verification are viewed as a factor in favor of integration; because during the period of military governments in both countries rivalry precluded any understanding.

Collor Proposes Revision of FRG Accord

90WP0154C Sao Paulo O ESTADO DE SAO PAULO in Portuguese 5 Sep 90 p 4

[Unattributed article: "Collor Proposes Revision of Nuclear Accord"—first paragraph is O ESTADO DE SAO PAULO introduction]

[Text] The president has told a German newspaper that he would rather try to find a "less predatory" form of energy.

Brasilia—In an interview granted to the German newspaper DIE WELT, President Fernando Collor advocated revision of the Brazil-Germany nuclear accord because he believes that Brazil is in a position to seek new, "less predatory" energy alternatives that are compatible with ecological considerations. "To my way of thinking," Collor told journalist Werner Thomas, "the thesis of nuclear energy is not proving out very well. I have great confidence that the German Government, in the light of what is happening today in the Persian Gulf, will also rethink the thesis of collaboration with other countries in the area of nuclear energy," the president declared.

Collor stated in the interview that the argument, for example, to the effect that Brazil will need nuclear energy in 2050 is one that he does not find convincing, because he is sure that by 2050 "people will be buying energy diskettes at stationery stores." The president also said that the modernization he has been preaching "does not harmonize with preoccupations that relate to armament." As for the possibility that Brazil will develop an atomic bomb, Collor repeated the point of view he had disclosed the day before to another foreign journalist, the Canadian Paul Knox of THE GLOBE AND MAIL. "My government," he said, "will never permit—or even entertain the remote possibility of—the construction of an atomic bomb, because among other things the fact is that the Constitution prohibits it."

[Box, p. 4]

The Accord Was Signed in 1975

The nuclear accord signed in 1975 by Brazil and West Germany during the administration of President Ernesto Geisel authorized the transfer of German technology for the entire cycle of nuclear fuel and the construction of eight atomic power plants. Of the eight power plants, Angra II, the first one built under the terms of the accord, was scheduled to go into operation in 1980 but will only be ready four years from now, provided funds are available.

Contemporaneously with the activities implemented under the terms of the accord, Brazil carried out its parallel nuclear program, a program announced officially by President Jose Sarney on 4 September 1987, following seven years of research conducted in secret. This initiative displeased the German Government, which warned Brazil concerning the orientation of the program, which Bonn considers to be "directed toward a military purpose." On that occasion Sarney reported that Brazil had succeeded in mastering the complete cycle of atomic energy through the application of technology for enriching uranium by the process of ultracentrifugation. He reiterated, however, that Brazil intended to use nuclear energy solely for peaceful purposes.

Brazil took the next step in this area when in November 1988 the government put into operation—at the Institute for Nuclear and Energy Research (IPEN)—the first Brazilian nuclear power reactor.

Early in the Collor administration the Secretariat for Strategic Affairs prepared a report on nuclear activities in Brazil. In its report the secretariat recommended continuation of the parallel program, completion of the Angra II power plant, and a reappraisal of the cost of Angra III.

Collor To Review Entire FRG Nuclear Accord

90WP0158A Sao Paulo O ESTADO DE SAO PAULO in Portuguese 6 Sep 90 p 3

[Editorial: "Is It the End of the Nuclear Adventure?"]

[Text] President Fernando Collor intends to review the nuclear accord signed in 1975 with the Federal Republic of Germany [FRG], which called for the construction of plants and the transfer of technology for the entire uranium cycle. Since then little has been done, apart from incurring debts that exceed $4 billion. The president has referred specifically to nuclear power plants, which he does not view as representing the most suitable solution for Brazil. What exists, insofar as those plants are concerned? In fact, there is the equipment that we have purchased, much of it already delivered, and construction work projects at a standstill. There are two plants that should be in the completion or advanced construction phase. Remaining is Angra II, delayed for over 11 years, and now with a new prediction for its operation: changed from December 1995 to September 1997. Furnas, responsible for the work, wanted an annual budget of $300 million to complete it during the present government, but it will not procure those funds, which are not included in the 1991 budget. It would be a victory to finish it by the new date. As a result of this, the financial costs are rising to intolerable levels, and with them the kw-hour, which is now totally uneconomical. At Angra II, $1.2 billion has already been invested, with at least another $1.8 billion needed. The tragedy of this plant is that much of the construction work is advanced, and all the equipment is already in Brazil. As for Angra III, the deadline for its completion has broken the century barrier. It was moved from 1998 to 2002... For the two projects, which would increase Brazil's installed capacity by 2.4 million kw, at least $4 billion would be required; and that is an optimistic figure.

The president wants to review everything, from the plants to the program, which includes a transfer of technology that has not been carried out. It will be difficult to achieve a new system for the plants with the German suppliers. Consideration might be given to exchanging nuclear equipment intended for Brazil for other equipment, perhaps even from the energy area. However, this would be very difficult. What is fitting is to review the costs of Angra III, and to learn whether it is in our interest to continue or abandon it, reselling the equipment already purchased, and finishing Angra II, which will be needed for the Brazilian energy system.

Nevertheless, the president's statement goes beyond the two plants that have caused the country so much damage, solely and exclusively because they were extemporaneous and poorly planned. They lacked funds, not in dollars (the financing arrived, and we are paying interest on the interest), but in cruzeiros for the construction work and the installations. It is a farce. In essence, the Geisel government was not thinking of power generation. It intended to purchase eight nuclear power plants in order to master the unanium cycle and achieve the bomb. It is against that spirit that President Fernando Collor is quite rightfully rebelling. Brazil needs neither so many nuclear power plants nor heavy investments in research on the uranium cycle, to the point of mastering it within a short time, starting from zero, with its own technology, as is being proposed now. The special committee studying the program has called for investments of several billion dollars for that purpose, failing to take into account our exchange shortage and the lack of funds in cruzeiros to complete power plants that we have already purchased, that we are paying for, and that are packed in crates, causing us damage.

The president is correct in stating that he will review everything, starting at the beginning. This should, moreover, have been done by the previous governments following that of General Geisel. They did nothing. On the contrary, we went on to other projects that represented another nuclear adventure. Apparently all this could end now. We shall reassess everything, finish what needs to be finished, and stop what is dispensable. It remains to be seen whether we can count on the understanding of our German partners about reviewing the accord. It is likely, because they have other commercial interests in Brazil, and cannot run the risk of losing them. They realize that we are not going to build more nuclear power plants, at least during this government. It would be a veritable feat to finish those already in existence....

Details of Army Nuclear Project Revealed

Army Secretary Interviewed

PY1709160490 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

[Report by Paulo Motta]

[Text] According to General Romero Lepesqueur, Army secretary of science and technology, the Army's new slogan in connection with its nuclear projects is "demystify." An interview that he granted O GLOBO on Thursday, 13 September, marked the beginning of an "opening" process in the nuclear research conducted by the Army, the last of the Armed Forces services to give the press access to its nuclear facilities now that the Navy and Air Force projects are better known by the general public.

The Army project is easy to understand. At the Army Technological Center's (Cetex) Institute for Special Projects (IPE) in Guaratiba (Rio de Janeiro State), the Army is developing a nuclear reactor that uses natural uranium for fuel, air for cooling, and graphite as a moderating factor. This reactor is called an Experimental Irradiation Reactor [Reator Experimental de Irradiacao] (REI). Thus, the Army has been able to develop pure nuclear graphite, making Brazil the seventh country in the world to develop this strategic technology. The Army already has a subcritical reaction unit that is suitable for research. The REI, which has been included in the National Nuclear Energy Program, is being studied by President Fernando Collor and may be ready in 1994.

The main thing about this reactor is that it "produces" more plutonium than other types of reactors. Plutonium, which is one of the key components of nuclear weapons, comes out as a by-product mixed with spent fuel from the reactor. Because so-called international safeguards do not apply to the REI, this means the use of plutonium obtained in this way is not subject to International Atomic Energy Agency inspection.

However, Gen. Lepesqueur said the Army does not plan to use this plutonium for any purpose whatsoever, adding that it must first be reprocessed to separate it from spent fuel. The objective is to develop the so-called Modulated High Temperature Gas-Graphite Reactor (MHTGR), which is also being developed by the highly industrialized nations.

"Our plan is to fill a vacuum in the Brazilian nuclear program: production of the MHTGR. These are the reactors of the future because of their inherent safety. It is the Army's contribution to the development of nuclear energy in Brazil. The Army has no specific objectives in nuclear research. We are merely following the suggestions of the National Commission for Nuclear Energy and the Secretariat for Strategic Affairs. There are no tanks moved by nuclear fuel. Armies use nuclear energy only for their nuclear artillery pieces (guns that fire tactical atomic bombs)," Lepesqueur said.

He also guaranteed that the Army will not use the plutonium that will come from the reactor, but will store it together with other spent fuel elements in a nuclear waste reservoir.

"How to use the plutonium that must be separated from the fuel burned by the reactor is a government decision. Furthermore, one must want to do it, and have the

necessary technology and a considerable amount of burnt fuel," Lepesqueur said.

IPE Director General Nelson de Almeida Querido, of CETEX, explained that in order to avoid doubts about or a misinterpretation of the nuclear research that the Army is carrying out, it has been decided that the REI should produce no more than five megawatts of power instead of the 10 megawatts proposed in the original project.

"We could even build it to produce just two megawatts of power, which would be cheaper and would allow us to use refrigeration systems already available on the local market. These are strategic limitations to make it clear that the Army has no intention of getting plutonium to make nuclear weapons. In other words, it will have the lowest power possible. The REI will only be used for research," Gen. Querido stated.

Even so, the REI will be able to produce approximately 400 grams of plutonium mixed with spent fuel each year. This plutonium will be the result of the burning of uranium-235 in the reactor; this releases neutrons that are captured by uranium-238, which becomes uranium 239, the best plutonium there is. According to experts, 17 kg of plutonium are needed to build an atomic bomb.

However, despite all of the Army pledges that it will not use plutonium, its own technicians admit that the Army's plan for the development of nuclear technology is very similar to the one followed by the United States in the forties to produce the first atomic bomb. Thus, the subcritical unit at CETEX is similar in concept—although not critical—to the Fermi pile (built by Enrico Fermi in 1942) and the REI will be similar to the X-10 reactor, the first in the world, which was built in Oak Ridge 11 months after the Fermi pile. After that, the Americans built the Hanford reactor and produced plutonium for the first atomic bomb.

"It is true that nuclear technology began with a reactor like the REI. These are the simplest of all reactors. However, the X-10 was a lot more powerful (20 megawatts as opposed to REI's five) and capable of producing up to four kg of plutonium per year. The Army guarantees that the REI is purely a research reactor. However, the USSR and the United States use similar, although larger, reactors to produce plutonium," Gen. Querido said.

More on Army Reactor Research

PY1709192290 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

[Text] Close to 50 experts are currently working at the Army Technological Center's [Cetex] Institute for Special Projects (IPE). After four years of research this institute has put a subcritical unit into operation for use in parameter studies. This unit looks like a two-meter-high cube, and it is filled with a pure graphite structure and contains radioactive materials.

It is a subcritical unit because it does not allow self-sustained nuclear reactions as in critical units (reactors), and because it requires an external neutron-emitting source (in this case, americium-beryllium). According to General Nelson Querido, the unit does not need bars to control the flow of neutrons.

IPE's main objective is to build its first critical unit: the Experimental Irradiation Reactor (REI).

A subcritical unit multiplied by eight and with a self-sustained reaction is the basis of the REI, Gen. Querido said.

According to the general, the REI will essentially be a very low power research reactor. He added that its basic design is in an advanced stage. The REI would be built in a six-story building inside Cetex. The core will be made up of nearly 500 tons of pure graphite that will hold cylinders of natural uranium. The unit will be surrounded by an armor of heavy concrete, and the atomic reactions in it will be controlled by 16 bars of boron wrapped in steel or aluminum with the power to absorb the neutrons that can start a chain reaction. A secondary system made up of boron pellets inserted in the core though holes drilled at a diagonal will stop the reaction in case of an emergency.

The unit will be refrigerated with air blown by an exhaust system. The air will be filtered before entering the core to eliminate impurities, and after entering the core to eliminate irradiated particles. The air that is heated by the reactor will be cooled by a 60-meter-long chimneylike device. As for potential combustion of the graphite as a result of tensions caused by reactor activity, Gen. Querido explained that the residue will be eliminated through a regular "recooking" of the graphite to eliminate those tensions.

In fact, the REI will only be the first step before construction of a High Temperature Gas-Graphite Reactor (HTGR), which is refrigerated by carbon dioxide, and before a Modulated High Temperature Gas-Graphite Reactor (MHTGR), which is refrigerated by helium. According to the IPE director, the process will take 20 years of research, but these are the reactors of the future for energy production because the security is passive—that is, they have a capacity for self-control and can thus avoid accidents.

According to IPE nuclear engineer Colonel Antonio Carlos Ruas Santos, the HTGR reactors use 20 percent enriched uranium, mixed with thorium, as fuel. The MHTGR is modular and can be expanded. Each module can generate 135 megawatts.

Because they are intrinsically secure, these reactors can be built near cities and industrial complexes to generate electricity, or even to heat up residences, desalinize

water, or heat up boilers. Another security factor is the fact that the core is underground, and excess heat can be radiated to the surrounding concrete structure and the soil around it, Col. Ruas said.

The first experimental HTGR's were developed in the United States and the FRG in the 1970's. The MHTGR's were developed in the United States in the 1980's, but they are still awaiting licenses. According to Gen. Querido, in the future these types of reactors could be used as mobile energy generators—a small reactor weighing 15 tons could be used to generate energy in war situations.

As for criticism that the uranium-graphite reactor is already obsolete, the IPE director stressed:

The PWR's [Pressurized Water Reactors] will dominate the field for a long time to come, but the security and efficiency of HTGR reactors will prevail.

Almost 50 Experts Researching

PY1709182290 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

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CNEN Told Not To Comment

PY2009163890 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Sep 90 p 16

[Text] Planalto Palace has ordered the National Commission for Nuclear Energy (CNEN) Executive Board not to make any statements on the Army nuclear program. The government made this decision on 17 September following an interview published by the Rio de Janeiro newspaper O GLOBO in which General Romero Lepesqueur, Army secretary for science and technology, confirmed the existence of a project to develop an experimental nuclear reactor at the Army Technological

Center (Cetex) in Guaratiba, Rio de Janeiro State. This information had already been reported by the press in October 1989, but Planalto Palace did not approve of the general's confirmation, CNEN sources have reported.

Reserve Colonel Geraldo Cavagnari, coordinator of the Strategic Studies Group [Nucleo de Estudos Estrategicos] (NEE) of the Campinas State University (Unicamp) and an expert in military strategy, has said: "The Army should now follow the Navy's example and disclose its true plans in this field." From a military viewpoint, Cavagnari said, that research can only be justified in two ways: either the Army wants to train its cadres in the nuclear area and, subsequently, transfer the results to the civilian sector, or it wants to build an atomic bomb. Recent army history in any country in the world provides more than one example of nuclear research whose final objective was entirely military.

"The Navy has already made its plans clear," Cavagnari said. It wants to develop a nuclear reactor to power a submarine, a fact that is consistent with the history of the Armed Forces of other countries and that therefore casts doubt on the Army plans. Cavagnari prefers to believe that the Army does not want to have nuclear bombs now, but this will only become clear through unambiguous information. "It is not enough to just report that the Army is developing a reactor," he said. The Army must specify its objectives more clearly "so they do not have to leave undeclared plans up in the air."

Cavagnari's concern is also justified by the fact, recalled by one of his NEE colleagues, that the Army's disclosures are closing a sort of logical circle. In other words, it is only natural that the Aeronautics Ministry wants to develop its own high-technology missiles. And it is only natural that the Navy wants to have the latest in submarines, in this case, nuclear ones. "Only the Army's piece was missing in this puzzle," recalled Cavagnari for whom "the circle will be closed if the Army, in fact, wants nuclear weapons."

Physicist Odair Dias Goncalves, a member of the Brazilian Physics Association (SBF) nuclear affairs monitoring commission, has said: "It does not matter if the Armed Forces want to build a bomb or not, but all that research cannot be decided on without passing through Congress." In October 1989, Reserve Navy Commander Antonio Carlos Didier Barbosa Viana, chairman of the Tecmat enterprise, one of the enterprises involved in the Navy reactor project, disclosed that the Army's uranium and graphite reactor should be built by 1995. On that occasion, Viana said that in 1981 the CNEN decided that the Navy should be in charge of developing the uranium enrichment project and the Army the technology to produce pure graphite.

Further on Army Plutonium Research

PY2009174090 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Sep 90 p 16

[Text] The Brazilian Army's main revelations in its effort to demonstrate the "transparency" of its objectives in the nuclear field point to one subject: the production and use of plutonium. This radioactive element is regarded with suspicion by the international community because its use is not always safeguarded. Every time there is a suspicion that a terrorist may be preparing a homemade atomic bomb or that some Third World country is developing nuclear weapons, plutonium is always the first suspect. Contrary to the expensive metallic uranium used in bombs by developed countries, plutonium may be obtained as a by-product from reactors that are not under international safeguards.

General Romero Lepesqueur, Army secretary for science and technology, told O GLOBO that his force has a subcritical reactor that uses natural uranium for fuel, pure graphite for the control rods, and air for cooling. This prototype, which cannot unleash a self-sustained chain reaction, will serve to project an Experimental Radiation Reactor, REI, [Reator Experimental de Irradiacao] scheduled for 1994. The REI will not be under international safeguards, and it will produce nearly 400 grams of plutonium mixed with nuclear fuel per year. An atomic bomb can be made with 17 kg of plutonium.

Although all the military officers interviewed by O GLOBO have repeatedly denied any war objective, the uranium cycle has been nearly completed with the disclosure that the Institute for Nuclear and Energy Research, IPEN, in Sao Paulo is already capable of separating plutonium from the nuclear fuel spent in national reactors not subject to international safeguards.

Given the lack of plutonium to develop this process, the IPEN resorted to a trick. It worked with elements with chemical properties similar to plutonium. Thus, IPEN experts managed to develop a method to separate thorium and gadolinium, elements with a chemical reaction similar to plutonium, from fuel mixtures.

The final objective of mastering the plutonium cycle, according to Rear Admiral Othon Luiz Pinheiro da Silva, president of the Navy Coordinating Board for Special Projects, is to provide the country with an alternative energy source. According to the rear admiral's calculations, current reserves available in Brazil are enough to operate 30 large reactors for 30 or 35 years. With the addition of plutonium to the enriched uranium currently used as reactor fuel, that period could be extended 200 to 300 years.

The Army's disinterest in obtaining plutonium for military purposes was repeatedly stressed by General Nelson de Almeida Querido, director of the Institute of Special Projects. Proof of this is that the Army decided to adopt a five megawatt standard for the REI, instead of

choosing double this power, which would generate a proportionally larger amount of plutonium.

Congressional Oversight Urged

PY2009190090 Rio de Janeiro O GLOBO in Portuguese 18 Sep 90 p 20

[Report by Monica Medeiros]

[Text] Brasilia—Deputy Fabio Feldmann (PSDB-SP) [Brazilian Social Democracy Party-Sao Paulo State] will ask Army Minister Carlos Tinoco to explain the nuclear research under way at the Army Technological Center (Cetex) in Guaratiba, Rio de Janeiro. Feldmann, who is trying to find an explanation to the parallel nuclear program, wants to know why the Army is being equipped with no specific objective, as stated in an interview granted to O GLOBO by General Romero Lepesqueur, Army science and technology secretary. Feldmann will ask the Army Minister to give details of the research and its cost.

Feldmann said: It is very strange for a military official to admit expenditures in research with no specific objective for the Army. If the research has no military objective, such as making an atomic bomb and if it serves only to contribute to the development of the Brazilian nuclear program, as stated by Lepesqueur, why isn't that research under the National Science and Technology Secretariat?

According to Feldmann, President Fernando Collor should adopt measures in line with his recent remarks on nuclear energy to foreign newspapers. In the beginning of September, Collor told the Canadian newspaper THE GLOBE AND MAIL that by no means will his government make anyone consider the possibility that it is manufacturing the atomic bomb. Collor told the German newspaper DIE WELT that the country is in a position to look for new and renewable energy alternatives and that he therefore supports the revision of the Brazil-FRG nuclear agreement. Feldmann objects to the fact that the Army is developing a program that is contrary to the president's ideas and which is not in keeping with the Army's constitutional functions. According to Feldmann, the explanations given by the Army science and technology secretary on the objectives of the research being carried out with the REI [Experimental Irradiation Reactor] reactor, which could yield plutonium (raw material for the atomic bomb) as a by-product, are "not very convincing." He stressed the importance of the constitutional mandate of the National Congress to follow and oversee works in that area. Almost two years after the promulgation of the Constitution, Congress has not yet created the necessary institutional mechanisms to deal with this matter. According to Feldmann, this revelation shows that Congress is lagging behind current events.

Congress should be ready to deal with this matter and has been caught off guard by the newspapers. This is another reason for Congress President Senator Nelso Carneiro to expedite the creation of a specialized commission to deal with the nuclear sector.

Future Research Plans

PY2109193090 Rio de Janeiro O GLOBO in Portuguese 20 Sep 90 p 21

[Report by Paulo Motta]

[Text] General Romero Lepesqueur, Army science and technology secretary, told O GLOBO last week that the Institute for Special Projects (IPE) of the Army Technological Center (Cetex) in Guaratiba, Rio de Janeiro State, will in the future carry out research in the area of chemical and biological warfare, beside its projects in the nuclear field.

"This does not mean we will manufacture chemical or bacteriological weapons, but we want to study their effects to develop antidotes, just as radiation must be studied to develop radiation protection," Lepesqueur said.

According to IPE Director General Nelson Querido, the Army nuclear project foresees the development of the so-called Experimental Irradiation Reactor (REI)—which uses metallic uranium as fuel, is controlled by pure graphite, and is cooled with air—with the purpose of mastering the technology of gas-graphite reactors, whose main example is the Modulated High Temperature Gas- Graphite Reactor (MHTGR), still being developed in several parts of the world. Cetex has a subcritical unit (in which nuclear reactions are studied), but the REI may yield as a by-product nearly 400 grams per year of plutonium, the key element in atomic bombs.

This plutonium, as well as the plutonium generated by the Navy reactor planned for the first Brazilian nuclear submarine, will not be under international safeguards—this means it will not be inspected—and it will be reprocessed with technology developed by the Institute for Nuclear and Energy Research (IPEN) run by the National Commission for Nuclear Energy (CNEN) in Sao Paulo.

The Army Science and Technology Secretariat was created in 1984. It has jurisdiction over the Military Engineering Institute (IME) and three centers: the Operational Evaluation Center, the Engineering Evaluation Center (which has a test facility in Restinga da Marambaia), and Cetex, which is subdivided into the Development and Research Institute, and the IPE.

The Army Science and Technology Secretariat has nearly 500 military and civilian scientists and experts, many of whom studied in the United States, France, and England. According to Lepesqueur, the objectives of this secretariat are to evaluate, prepare, and train human resources and to carry out research and development in three fields: doctrine, personnel, and above all, military materiel.

"We do not manufacture these items; we only develop and evaluate them. The Army may even use our projects in Imbel (War Materiel Industry) products, but our policy is to pass our technology to private companies," Lepesqueur said.

Army Reveals Participation in Nuclear Project

PY1609235090 Madrid EFE in Spanish 1808 GMT 16 Sep 90

[Text] Rio de Janeiro, 16 Sep (EFE)—For the first time, the Brazilian Army today revealed to the public its participation in a project for the construction of a nuclear reactor of the MHTGR type (Modulated High Temperature Gas-Graphite Reactor). The experimental unit will reportedly begin operating in 1994.

O GLOBO, which released the information today with extensive coverage, said that the Army command has decided to begin an "opening" process with its nuclear projects, which so far have been protected under the secrecy of the so-called Parallel Nuclear Program. However, the National Nuclear Energy Program must be approved by President Fernando Collor de Mello, the first president elected by vote since the 1964 military coup. The program must also be adjusted to the regulations established by the 1988 Constitution.

General Romero Lepesqueur, Army secretary of science and technology, and General Nelson de Almeida Querido, director of the Institute for Special Projects (IPE) of the Army Technological Center (Cetex), said the projects have no military objectives.

Gen. Lepesqueur said: "Our plan is to fill a vacuum in the Brazilian nuclear program. The MHTGR reactors are the reactors of the future because of their inherent safety. It is the Army's contribution to the development of nuclear energy."

Lepesqueur also revealed that an early stage of the MHTGR program is already in full development. This step involves the construction of the so-called Experimental Radiation Reactor (REI), which uses natural uranium as fuel, air for cooling, and graphite as a moderating factor.

IPE technicians have been able to develop pure nuclear graphite production, making Brazil one of the select seven countries that controls this strategic technology. IPE technicians are already working with a subcritical reaction unit that is suitable for research.

O GLOBO said that the big question about the REI concerns the fact that it produces as a by-product a large quantity of plutonium, which is one of the key elements in atomic weapons, and that this reactor is outside the control of the IAEA [International Atomic Energy Agency].

Lepesqueur said: "How to use the plutonium that must be separated from the fuel burned by the reactor is a government decision. The Army has no specific objectives in nuclear research. There are no tanks moved by nuclear fuel."

General Nelson de Almeida also explained that to prevent any doubts or incorrect interpretations of the objectives of the current nuclear research, the Army decided that the REI should produce no more than five megawatts of power instead of the 10 megawatts proposed in the original project. General de Almeida said: "These are strategic limitations to make it clear that the Army has no intention of getting plutonium to make nuclear weapons. In other words, it will have the lowest power possible. The REI will only be used for research."

Despite the guarantees given by the military chiefs, O GLOBO said that the Brazilian Army's plan for the development of nuclear technology is similar to the one followed by the United States in the forties to produce the first atomic bomb.

Air Force Projects Include Reactor, Lasers

PY1709182290 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 39

[Report by Jose Eustaquio de Freitas]

[Text] Sao Jose dos Campos—The Air Force has two large projects in the nuclear area that come under the direct coordination of the National Nuclear Energy Commission [CNEN]; they are advancing very slowly due to the lack of funds, and to ease international pressure. Theoretical studies and preliminary drafts and specifications for a rapid regenerator reactor [reator regenerador rapido] have been handed over to CNEN, which will use them to make a joint program with Argentina viable. As for enriching uranium with laser rays, this program will wait for improvements in laser technology, giving priority to the ultracentrifugal process that has been developed by the Navy and the IPEN [Institute for Nuclear and Energy Research].

The main types of research at the Aerospace Technical Center (CTA) emerged in 1975 after the return of researcher Sergio Porto to Brazil; he died in 1979. To make his project of enriching uranium with laser beams viable, Porto joined a group of military researchers that included Colonel Jose Alberto Albano do Amarante, who died in 1981; Colonel Reginaldo Santos, who is currently director of CTA's Institute of Advanced Studies; and Rear Admiral Othon Pinheiro da Silva, coordinator of the Navy's nuclear research at Aramar Center.

The suspicion of international organizations about the manufacture of atomic bombs by Brazil has caused numerous difficulties for the progress of that research. The death of Colonel Jose Albano do Amarante in October 1981 interrupted the research in enriching uranium with laser beams, and it became necessary to divide the project into stages. The development of laser technology for use in industrial, medical, military, and

space equipment projects was chosen, while theoretical studies and preparation of an expanded program continued.

Rapid reactors continue to be a CTA priority, but its studies have been handed over to the CNEN for two reasons. A choice for economic or strategic reasons could be made between a reactor that transforms thorium into uranium or a reactor that transforms uranium into plutonium.

The CTA is proposing the use of an experimental 100-megawatt reactor capable of using Brazil's reserves, which are estimated at 220,000 tons of uranium or 1.3 million tons of thorium.

Until there is a decision on these programs, the Air Force is implementing minor projects in the nuclear sector. The main ones are a thermal-electric generator to provide energy for radar stations and other equipment in remote parts of the country, such as the Amazon area.

Another project contemplates manufacturing a rapid reactor to generate energy for satellites. The reactor would be fueled by uranium and cooled with liquid lithium, would generate 100 megawatts, and would have a five to 10 year life in space. The CTA believes this reactor will be ready in 10 years.

This type of reactor only begins to function when the satellite enters the correct orbit. CTA scientists hope to build one similar to the so-called SP-100 that exists in the United States and has already been tested by the North Americans and Sao Carlos University; they are now trying to obtain a type of refractory connector capable of withstanding temperatures above 600 degrees, heat tubes, and converters for the electrical heat generated by the reactor.

Within three years the CTA hopes to have a prototype that uses electricity to simulate the reactor's operation; it must ask the IPEN, with the participation of national industries, to manufacture the equipment.

Minor Radioactive Accident Reported at Navy Lab

Newspaper Report

PY0609181090 Madrid EFE in Spanish 1607 GMT 6 Sep 90

[Text] Rio de Janeiro, 6 Sep (EFE)—The newspaper JORNAL DA TARDE reported today that an unprecedented radioactive accident occurred last week in a local laboratory linked to the Brazilian Navy's parallel nuclear program, which is designed to build a nuclear submarine.

Anselmo Paschoa, chairman of the National Commission for Nuclear Energy (CNEN), reported that chemist Sonia Helena Valente "inadvertently" contaminated herself while handling tapes [cintas] containing "Americium-241," a radioactive metallic element.

JORNAL DA TARDE reports that the Nuclear Engineering Laboratory (IEN) where the accident occurred is part of the nuclear program designed by the Brazilian Navy to build a nuclear reactor.

In 1988, the CNEN banned the use of "Americium-241" in manufacturing lightning rods even though a shipment of this element had already been purchased from the United States for this purpose. There are, however, thousands of "Americium-241" tapes still stored at the IEN laboratory.

Valente suffered only minor contamination, according to IEN officials, but the radioactive accident is being investigated.

CNEN Statement

PY1009214490 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 7 Sep 90 p 12

[Report by Regina Barreiros]

[Excerpt] Rio de Janeiro—The National Nuclear Energy Commission (CNEN) has officially termed "absurd" the information that work using americium-241 at the Nuclear Engineering Institute (IEN), on the Ilha do Fundao University campus, is part of the parallel nuclear program the Navy is developing in Ipero, Sao Paulo State. CNEN Executive Director Anselmo Paschoa refused to disclose the objective of the research with the radioactive metal that contaminated chemist Sonia Valente, sending word through his spokesman that it is "laboratory research."

Since the incident with the radioactive element last week, the work with it has been explained in at least two ways. It was first said that the liquid americium would be used to calibrate nuclear equipment, and later, that it would be used to study radioactive contamination in plastic materials.

Yesterday, the IEN said again that chemist Sonia Valente was contaminated while she was preparing americium nitrate to irradiate plastic materials. These materials would then be studied at the IEN's Physics Department where the radioactivity would be measured and radioactive properties analyzed. "Our work with americium has nothing to do with the Navy's program for developing a reactor for a nuclear submarine," affirmed Jessie James Gomes da Silva, head of the IEN's Radio-Protection Section [Secao de Radio-protecao], in explaining that the americium was not destined for the Aramar Experimental Center in Ipero, Sao Paulo State. [passage omitted]

Admiral Views Plutonium-Uranium Possibilities

PY1809014090 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

[Text] Sao Paulo—All reactors currently operating or under construction in the country—such as the ones at the Angra-1 power plant and research institutes and the

future prototype reactor that will be used to power nuclear submarines—can easily be adapted to operate with a mixed plutonium and uranium fuel.

According to Rear Admiral Othon Luiz Pinheiro da Silva, president of the Navy Coordinating Board for Special Projects [Coordenadoria de Projetos Especiais da Marinha] (Copesp), two obstacles have so far been hindering this objective: the lack of nuclear fuel available outside international safeguards and the fact that our country has still not developed the technology to reprocess uranium to obtain plutonium on a large scale.

In his opinion, some of the current problems will be resolved by the end of this decade at the latest after the completion of the first national reactors built outside international safeguards: one to be produced by the Army, two by the Navy (one for submarines and another for testing materials), and a fourth planned by the National Commission for Nuclear Energy (CNEN) to produce radioisotopes.

He added that those reactors will bolster the uranium reprocessing program, which has been designed by the CNEN and is at the laboratory phase at the IPEN [Institute for Nuclear and Energy Research].

Pinheiro said that when the first reactor for the nuclear submarine begins to operate at full capacity (this will be in 1996, according to the Navy timetable), it will be able to produce, during the first five years, 3.5 tons of waste for reprocessing. Of this quantity, 0.016 percent will be plutonium and a considerable portion will be reusable uranium.

Pinheiro estimates that Brazil's currently available uranium reserves can feed 30 large reactors of 1,200 megawatts each—this figure is equivalent to the power of the Angra-2 plant—for a maximum of 30 to 35 years. Plutonium will make it possible for Brazil to extend this period for 100 or 200 more years.

He said: According to studies by Eletrobras [Brazilian Electric Power Company, Incorporated], in 20 or 25 years the cost of one kilowatt produced by a nuclear plant will be equivalent to the cost of one kilowatt produced by a hydroelectric power plant. This period must be used for research and development. If we do not do this, we will have to resort to more very negative nuclear accords, like the FRG-Brazil agreement.

Gilberto Gomes de Andrade, chief of the Copesp Reactor Technology Department, said that the reactors in operation do not need any technical adjustments to operate with plutonium fuel. He explained that the only difference is that more careful steps are necessary in introducing the fuel into the reactor and reloading the reactor core.

Andrade said that the use of plutonium is more attractive from an economic viewpoint. It can be mixed with natural uranium, thus replacing the enriched uranium.

He added that the reprocessing of waste is an essential step for feeding the fast breeder reactors Brazil intends to build through the CNEN and the CTA [Aerospace Technology Center].

He explained that the quantity of plutonium obtained from those reactors through the generation of energy is up to 50 percent more than the quantity of plutonium that was originally fed to them. This happens because plutonium is created through the irradiation of uranium-238 with neutrons inside the reactor. Uranium-238 is the isotope with the highest occurrence.

Navy Looking for Dump Site for Nuclear Waste

PY1709182090 Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT 17 Sep 90

[Text] The Navy intends to select an island in the Brazilian littoral to store radioactive waste produced by nuclear submarines.

The site has not yet been determined, but it will be determined as soon as the country's submarine fleet begins to increase, something which, at the latest, should take place by the end of this decade.

This information was released by Rear Admiral Othon Luiz Pinheiro da Silva, chairman of the Navy Special Projects Coordinating Board [Coordenadoria de Projetos Especiais da Marinha].

Program Recommended To Continue Under Military

91WP0008A Sao Paulo ISTOE SENHOR in Portuguese 19 Sep 90 pp 38-44

[Article by Altamir Tojal and Carlos Jose Marques: "Armed Atoms"]

[Text] The manner in which President Fernando Collor responded to questions asked about the Brazilian Nuclear Program by the Canadian newspaper THE GLOBE AND MAIL and the German DIE WELT was disconcerting: "Nuclear energy for what? To build an atomic bomb? Why an atomic bomb?" The president's retort, posed in the form of questions, rekindled concerns that have been surfacing ever since the military began its tutelage of nuclear energy activities—controlling even the key installations such as the Aramar plant in Ipero in the interior of Sao Paulo State, where they secretly mastered the fuel cycle. This is because there exists the suspicion that, hidden under all this effort to master nuclear technology, lies a desire on the part of the Armed Forces to make Brazil capable of building atomic bombs.

There is no shortage of reasons why this subject could give the president some sleepless nights. Certainly the most immediate is a document delivered to him at the end of June by Secretary of Strategic Affairs (SAE) Pedro Paulo Leoni Ramos—the report prepared by the working group set up by the SAE to review the nuclear program.

Recommendations by the group, known as GT-Pronen, not only preserved but expanded the militarization of nuclear energy activities, thus fueling the apprehension that the bomb is still part of Brazil's plans. The report proposes that no fewer than six reactors be built under the direct control of the Armed Forces—three by the Navy, two by the Air Force, and one by the Army.

Autonomy Wears a Uniform

Investments in nuclear projects under military control alone would amount to $2 billion. Technical supervision would still be the responsibility of the National Commission for Nuclear Energy (CNEN), an agency now subordinate to the SAE itself, which in the new administration has taken over the functions of the now-extinct National Service for Intelligence (SNI). Hence this situation in which the military, in control of the key installations, enjoys enormous autonomy in carrying out its projects, while we persist in putting our faith in the dubious effectiveness of letting the government attempt to supervise itself, with the CNEN assigned to inspect facilities that are administered by the military ministries.

The umbrella of military autonomy, by the way, served to shelter not only the nuclear program but one of the most formidable business deals in the area of war materiel, one that has now surfaced: the commercial transactions with Iraq, for whom Brazil became one of the leading arms suppliers. Among the equipment sold were more than 3,000 Urutu tanks, 80 Tucano aircraft, and 500 Cascavel armored vehicles—part of the arsenal, composed of contributions from several countries, that threatens the world today. Military control of the Brazilian nuclear program and the sale of war materiel are two sides of the same coin and set up the equation that suggests the following question: If Brazil had already been a member of the exclusive nuclear club at the time of these transactions, would Saddam Husayn now have the bomb?

If it depended on men like retired Brigadier General Hugo de Oliveira Piva, perhaps he would. The general has been the center of media attention in recent weeks because he took a group of Brazilian scientists who used to work for the Aerospace Technology Center (CTA) to Baghdad to work on what is said to be a "secret Iraqi project" connected with missile technology—in an arrangement made outside the purview of the government and condemned by Itamaraty. Piva is the visible side of sectors of the Armed Forces that are committed to a military orientation of the nuclear program. In 1983, as director of the CTA, he once predicted: "Brazil is in fact capable of making an atomic bomb, and production requires only a political decision."

In an interview with ISTOE SENHOR, Admiral Maximiano da Fonseca, one of the pioneers of the so-called Parallel Program when he held the post of Minister of the Navy in the Figueiredo administration, said: "The problem with making the bomb is getting the raw materials, and we already have the enriched uranium." Three years ago, the admiral also admitted publicly that Brazil was close to realizing one of his greatest dreams: "To call in representatives of the military powers, explode a nuclear device in order to show what can be done, and then announce that Brazil will not make any more of them because it has better things to do with its money."

Stocks of Uranium

Officially, military authorities vehemently deny pursuing such an objective. "The idea is absurd, and devoid of any rational basis," was the reaction from current Navy Minister Mario Cesar Flores, when asked by ISTOE SENHOR about concerns that Brazil is moving in the direction of nuclear devices. Although they may deny it, the military cannot refute the evidence that, within the borders of their nuclear facilities, they have reached such a stage of technological development that, depending on political decisions and funding, they possess all the conditions for making the bomb.

"While people debate whether or not Brazil has the bomb, whether or not it is building it, the Armed Forces have since 1979 traveled, one step at a time, the entire road required to be able to do it," warns physicist Luiz Pinguelli Rosa, a tireless critic of nuclear activities. To prove there is a basis for this concern, Pinguelli coordinated a study made by the Brazilian Physics Society (SBF) that demonstrates how, with the resources already available, the Brazilian military could detonate a device similar in power to the Hiroshima bomb. It would take them only a little more than a month, and cost a little more than $2 million, provided they had on hand 18 kg of 94 percent enriched uranium. To achieve this, they need only to spend six days processing, at existing Aramar Experimental Center facilities, 118 kg of the 20 percent enriched uranium that the government officially admits it uses in its work there.

Rear Admiral Othon Luiz Pinheiro da Silva, director of the Special Projects Coordinating Board (Copesp), the Navy agency that controls Aramar, revealed that the current inventory of 20 percent enriched uranium is "four elements," which means four kg. Also in stock are 175 kg of five percent uranium. "Starting in June of next year, we will begin to produce 20 percent enriched uranium at a rate of three elements a month," announced the director of Copesp, recalling that this had been the goal set for January 1990, but meeting it "was delayed by budget cuts."

Rear Admiral Pinheiro da Silva was the man mainly responsible for the "Parallel Program," which led to the mastery of the complete nuclear fuel cycle, with enrichment of the uranium via the ultracentrifuge process, as well as to the development of reactor technology. Despite insistent denunciations by the scientific community, the existence of such an effort was emphatically denied, although it involved hundreds of technicians and scientists and had the participation of more than 100 private manufacturers. One of the most mysterious aspects, still unanswered, is how the enriched uranium

was obtained to run the so-called critical unit at the Institute for Nuclear and Energy Research (IPEN), in 1984.

That critical unit, a small experimental reactor, uses 20 percent enriched uranium which Brazil could not have possessed at that time. "Where did the uranium for the critical unit come from?" asks Professor Pinguelli. He offers his own theory: that the answer may be tied in with another mystery, the clandestine shipments of yellow cake (uranium concentrate) to Iraq, discovered by the press in 1982. "It is not completely impossible that Brazil received enriched uranium in exchange for those shipments," the professor says. Obviously that material would not have come directly from Iraq, which was also pursuing the enrichment technology. But another country could have been involved, in a triangular operation: "Perhaps China," Pinguelli suggests.

The "Holes" at Cachimbo

It was secrecy and military control, adopted with the justification that international pressures would prevent pursuing the research that was being done, that also made possible the drilling, at the Cachimbo Air Base in southern Para State, of wells 320 meters deep and more than one meter in diameter. These wells are practically identical to the ones used in the United States for testing low-power atomic bombs. Nothing was known about those facilities until one of the technicians from the company contracted to do the work disclosed their existence. Even today, military men deny that the holes were intended for nuclear testing, but they have never succeeded in giving a convincing explanation for them, and they remain under the control of the Armed Forces General Staff (EMFA). Questioned about the "holes" at Cachimbo, the president of the National Commission for Nuclear Energy, Jose Luiz de Santana, tried to refer the question to the past by recommending: "You should ask the officials who were in charge at the time." And he recalled a quip attributed to Rear Admiral Pinheiro da Silva: "I can only assure you the hole is a virgin."

The preparation of those wells would turn out to be the most time-consuming phase in any attempt to conduct nuclear testing, according to the SBF study. Virgin or not, they are ready and waiting for someone to decide to use them. And this seems to have been the military reasoning for more than 10 years, passively accepted by all Brazilian governments so far: to finish all the stages that permit the bomb to be built and tested in record time once the decision has been made to do so. The enriched uranium may even already be available. The country has the technical, scientific, and industrial ability to build the device.

According to the SBF study, it would require no more than six scientists and technicians to make a "low-efficiency nuclear explosive," that is, a device that is not operational from a military standpoint, but would demonstrate Brazil's capability. Last, the wells for the testing are already in place. "It is as if we already had everything we needed to assemble a car—wheels, chassis, engine, body—so that all we need to do is put the parts together," Professor Pinguelli points out.

It is in this context that the report by the SAE working group heightens concerns about the militarization of the program. The proposal to reorganize the sector changes almost nothing about the current situation in which the bulk of the nuclear facilities are in military hands. The group's only proposal for opening up the program to the public eye is a suggestion that the Commission's [CNEN's] executive board be expanded. It "would be chaired by the Secretary of Strategic Affairs, and its members would be appointed by the president of Brazil."

As regards the increased military role, the document not only advises against privatizing Nuclep [NUCLEBRAS Heavy Equipment, Inc.], the nuclear equipment factory set up under a joint venture with the Germans, but recommends that Naval Projects Management Company (Engepron), affiliated with the Ministry of the Navy, have a financial interest in the firm. It also approves the invitation extended by the CNEN to the Army Technological Center (CTEx) to take part in developing the gas-cooled nuclear reactor technology, "a project that has been following the criteria of expansion of domestic technology in the nuclear area." Furthermore, the report considers it "desirable for the country to continue the advanced research...aimed at the construction of fast uranium-plutonium reactors," under the auspices of the Ministry of Aeronautics.

The original justification for the Navy's reactor projects was development of the propulsion system for nuclear submarines, a question on which the government has not made a decision, and on which there has been little debate in Brazil. The aeronautics ministry's plans, the responsibility for which lies with the Institute for Advanced Studies (IEAv), headed by Air Force Colonel Reginaldo Santos, are even more intriguing. They include, for example, use of nuclear generators on satellites at a time when the world's space powers have already abandoned this source of energy because of the risk that if a satellite fell to earth and crashed, it could spread radiation. The Air Force reactors would use plutonium as a fuel, the same material used in the production of a bomb. To complete the picture, there is the Army's plan to build a gas-cooled graphite-moderated reactor, but there are no arguments to justify such a project being kept in military hands.

CNEN president Jose Luiz de Santana is extremely reticent about the Army's reactor. "It is still in the conceptual phase," he says, downplaying its importance. But the SAE working group's document reveals that $49 million has already been spent on its development by the Institute for Special Projects (IPE), part of CTEx, which is subordinate to that branch of service's Secretary of Science and Technology, General Romero Lepesqueur. That is a lot of money to spend just on concepts. Actually, work is supposed to be finished on the reactor

by 1994, and a subcritical unit has already been built for the initial experiments. Completion will require spending an additional $72 million.

Dividing the Spoils

So, President Collor is faced with the military's longing to hold onto the reins of the program, and he has an important and delicate decision to make: whether to preserve or abolish the military autonomy, by approving or rejecting the GT-Pronen report on his desk. As early as the beginning of March, before the new administration took office, Navy Minister Flores, Minister Carlos Tinoco of the Army, and Socrates Monteiro of Aeronautics, were already meeting to launch a tug of war for the spoils of the CNEN—which includes major research bodies in the nuclear field, among them the Institute for Nuclear and Energy Research (IPEN). A meeting held not long before, in Sao Paulo late in the week before Carnival, brought one of Zelia Cardoso de Mello's closest advisors and Rear Admiral Pinheiro da Silva face to face. The admiral put forth two points that were later ratified in a meeting of the military ministers: he urged immediate abolition of INB (Nuclear Industries of Brazil), and dismemberment of the CNEN.

According to the plans which the rear admiral outlined during the discussion, the INB (successor to Nuclebras under the Brazil-Germany agreement) would be deactivated. As for the CNEN, the Navy sought to skim off the "cream" of that commission: IPEN. Taking advantage of the precedent set by the Navy, General Tinoco instructed his subordinates to fight for the Belo Horizonte-based Nuclear Technology Development Center (CDTN), also part of the CNEN. It was to adopt a common approach in the defense of their interests that all three of Collor's future military ministers held a meeting at the Brasilia Air Base, at which they confirmed their desire to strengthen the nuclear part of their portfolios. They are still waiting for an answer.

On Tuesday, 4 September, there was word of a new action by Minister Flores. A document sent from his ministry to the Attorney General of Brazil has aroused suspicions in the Department of the Environment of Rio Grande do Sul that the Navy is planning to use that southern state's ports to bring in nuclear material imported from Argentina. The ministry sent a request to have a suit brought in the Federal Supreme Court to declare unconstitutional the articles of the Constitution of Rio Grande do Sul that prohibit the installation of nuclear energy production units and the transportation and storage of nuclear wastes in that state. In the suit, the Navy alleges that the southern state's Constitution "would conflict with the interests" of that branch of service in the atomic energy field.

The issue of control over nuclear activities is an old one, dating back to the decision by the Brazilian Government not to sign the international Nuclear Nonproliferation Treaty, the NPT, a decision that was ratified on 12 September in tandem with the Argentine Government. Brazil condemned the asymmetry of the treaty, which prohibits countries that do not have nuclear weapons from obtaining them, but allows nuclear powers to continue arming themselves. So, none of the facilities created under the Parallel Program, which acquired official status in 1987, are subject to international safeguards. Internally, there is only CNEN technical supervision.

A good part of the scientific community, at least, considers this system inadequate, since it leaves the program too vulnerable to accidents, sabotage, terrorist acts, and diversion of methods and materials to other countries—besides the weaponry-happy experiments not authorized by the Constitution. In this regard, the SBF report suggests that a technical standing committee be set up, one that would be subordinate to the National Congress and have unrestricted access to all nuclear facilities in Brazil. It would be charged with inventorying and monitoring the production and allocation of all radioactive material. That would keep the sum of the evidence from giving rise to the kind of concerns that military officials call speculation. These have arisen, it is said, ever since the Armed Forces started work on the alternative project to the nuclear agreement signed with Germany in 1975.

Everything seems to indicate that one certainty pervaded atmosphere surrounding the development of the Parallel Nuclear Program: that building the bomb could, at a given moment, become a conscious goal, even if that were not the intention. "This country really can build the bomb, but we are not thinking about doing that," claims Rear Admiral Pinheiro da Silva, of Copesp. The fact is that the Navy is in the midst of a major expansion of its Aramar Experimental Center, located 120 km from the capital of Sao Paulo State. That center is the main headquarters of the Parallel Nuclear Program, created 11 years ago and which two years ago succeeded in enriching uranium to 20 percent. With three percent enriched uranium, you can undertake to run nuclear power plants like Angra I. With 20 percent enrichment, you can operate research reactors and nuclear submarines. At more than 90 percent, you can set off an atomic bomb.

The Nuclear Club

Moving from 20 percent to 90 percent is a matter of processing the uranium in the so-called ultracentrifuge machines for a longer time. The big question is the number of ultracentrifuges available. Aramar has 900 so far, and there are 16 more in the IPEN laboratories. The SBF estimates at 3,000 the total number of units needed to accumulate enough 20 percent uranium to make a bomb. The goal at Aramar, Rear Admiral Pinheiro da Silva admits, is to equip the facility with 6,000 to 10,000 ultracentrifuges. The technology for this already exists. It is all a matter of investment—and political commitment.

The pilot enrichment plant at Aramar occupies an area of 3,000 sq m, with gas washer tanks connected to the structure. In the past two years, ground has been broken

for three big buildings, still under construction on a plateau of nearly 24,000 sq m, to house the remaining ultracentrifuges. The heart of the system is a control room where, via four panels of "programmable logical data," the information on the enrichment process is monitored and gathered—data on everything from the purification in cascades to injection and removal of the uranium hexafluoride, the gas that results from the yellow cake. Aramar is moving full steam ahead and without interruption toward its main objective, which is to produce fuel on a scale that can feed the reactor of a nuclear submarine.

This is where another one of the components related to the bomb comes into play. Although the Brazilian Navy points out that the nuclear side of its project will be limited to the propulsion for the vessel, it is a fact that the four countries that have nuclear submarines (the U.S. with a fleet of 231, the USSR with 222, England with 27, and France with 20) have used them in order to transport bombs. The exception is India, which received its only submarine of this type from the Soviets. Rear Admiral Pinheiro da Silva says the difference is that those countries first developed the bomb, and then obtained the submarine almost as a by-product. According to the calculations in the SBF study, the submarine project is supposed to cost about $2 billion. Copesp disputes the value ascribed to the submarine: the board insists that it can be built with an investment of $359 million.

Simultaneously with this Navy project, the Air Force is conducting a project to produce a satellite launch vehicle, known by the acronym VLS. The fact that a space program of this nature and another program in the nuclear field are being tackled at the same time raised the suspicion, in other parts of the world, that Brazil yearns to prepare itself to have missiles equipped with nuclear warheads. It is certainly true that this mistrust has also served as an argument in favor of the blockade erected by the big powers against technological efforts by Third World countries in those fields. Among the victims of that blockade, Brazil is no exception. On the contrary, it is the nation being watched most closely, since it has the best chances of success.

Deal With China

Despite that, Brazil has been conquering one phase after another in the VLS project. A crucial phase was reached with the development of the Sonda 4 rocket. In another move to circumvent resistances, a counterpart treaty with China was signed four years ago, bringing Brazil closer to the satellite launcher and, therefore, to a possible nuclear missile. One of the main items in the bilateral agreement calls for Brazil to pass on to the Chinese all its know-how in the area of solid fuels. In exchange, it will receive the rocket guidance system. The array of technological barriers erected by the big powers served as an argument for the military not only to gain control of those programs, but to adopt a system to throw the public off the track.

The calculated deception included secret budgets and the use of covert funding in the Parallel Nuclear Program, like the Delta 3 and Delta 4 accounts that came to light when the press denounced them in 1986. It also gave rise to a whole range of speculations as to whether state and private corporations were being used to import products that are subject to international safeguards. One of those rumors involved Petrobras and the Verolme shipyard, which were said to have served as middlemen in the purchases. It was because they had misgivings that it would be used for military purposes that the U.S. Government resisted selling Petrobras the IBM 3090 supercomputer with vector facility. It was only after lengthy negotiations that the equipment was eventually installed.

At the time, then-president of CNEN Rex Nazareth told SENHOR, in a statement that appeared in that magazine's issue of 26 May 1987, that once in possession of such a computer, "the pace of Brazilian nuclear research would be dramatically accelerated." More recently, the Americans once again demanded guarantees on the sale of another supercomputer, this time to Embraer. The fear, as Gary Milholin, director of the Wisconsin nuclear weapons control project put it in an article that appeared in THE NEW YORK TIMES last month, is that the equipment might be used by the CTA to help Iraq get the atomic bomb.

As long as the military continues to hold control over Brazilian nuclear activities, it is inevitable that there will be such concerns, and that the big powers will use the argument to justify their technological blockade of Brazil. Likewise, questions such as those President Collor himself put to foreign journalists will continue to be raised internally.

[Box, p. 40]

Helpful Hints

The working group's document did not answer Collor's questions; instead it puts some difficult decisions in his lap: "Nevertheless, the Group believes it is desirable for the country to continue the advanced research in the area—if possible, by obtaining international cooperation. Efforts would be concentrated on the conceptual study and acquisition of technological capability in the thermohydraulics of sodium, in materials, fuel elements, and the measurement of nuclear parameters, with a view to building fast uranium-plutonium and uranium-thorium reactors. This effort would include provision for construction of a 20-megawatt experimental fast reactor early in the second decade of the next century."

[Box, p. 41]

Guardians of the Button—These Men Can Decide When To Push It

These three military officers now command Brazil's principal nuclear facilities and projects:

- Rear Admiral Othon Luiz Pinheiro da Silva. He conceived and was primarily responsible for implementing the Parallel Program. He is the director of the Special Projects Coordinating Board (Copesp),

which controls all the facilities at the Aramar Experimental Complex in Ipero, Sao Paulo, including the uranium ultracentrifuge enrichment plant and the project to build the prototype reactor for the nuclear submarine. Copesp also controls those facilities at the Institute for Nuclear and Energy Research (IPEN) in Sao Paulo that are not subject to international safeguards.

- Air Force Colonel Reginaldo Santos. He heads the Institute for Advanced Studies (IEAv), an agency in the Ministry of Aeronautics that is connected with the Aerospace Technology Center (CTA) in Sao Jose dos Campos. Sao Paulo. The IEAv is one of Brazil's pioneer institutions in nuclear research, and is responsible for the project on the laser method of uranium enrichment. It is also developing two small reactors, one for satellites and another for telecommunications repeater stations.
- General Romero Lepesqueur. As the Army's secretary of science and technology, his command includes the Army Technological Center (CTEx), at whose Rio de Janeiro facilities a gas-graphite reactor is being built, using metallic natural uranium. Some $49 million have already been invested in the conceptual design, basic plans, and a subcritical unit (for preliminary testing). This kind of reactor produces a high volume of plutonium.

[Box, p. 44]

Progress in the Shadows—Technology Came With the Parallel Program

"It was Brazil's greatest technological victory ever," says Admiral Maximiano da Fonseca, still enthusiastic when he talks about the Parallel Nuclear Program that led to the mastery of the technology for enriching uranium by the ultracentrifuge process, and proud of having backed this technical coup. Da Fonseca was the Navy's director general of materiel in 1978, when then-Commander Othon Luiz Pinheiro da Silva returned from taking a course on nuclear energy in the United States, convinced that Brazil should make an independent technological effort in that area, despite having signed an ambitious program of cooperation with Germany three years earlier.

With the backing of Da Fonseca, who would later assume the post of Minister of the Navy in the Figueiredo government, and authorized by the Navy General Staff, Commander Pinheiro da Silva went on to head the secret program that had as its priority goal the mastery of the nuclear fuel cycle. The military justification for the effort was this plan to build the nuclear submarine, and the social legitimacy was said to lie in the benefits that it would extend to other sectors, such as energy production and other applications of nuclear technology.

Little by little, Pinheiro da Silva, now a rear admiral, built up the organization that made a reality of the parallel program. As early as 1979, he won the collaboration of the aeronautics ministry's Aerospace Technology Center. Right afterward, he obtained the unofficial cooperation of experts from the Institute for Nuclear and Energy Research (IPEN), the country's most important such institute, later to become the civilian arm of the program. The support of the National Commission for Nuclear Energy (CNEN) would also come gradually—first via the collaboration of then-director Rex Nazareth Alves, who became the head of that organization in 1982 and took on all the administrative support of the Parallel Program, including the operation of the "Delta 3" and "Delta 4" secret accounts, from which came the bulk of the funds invested in the program until last year—about $130 million on the uranium enrichment project and $140 million on developing the prototype of the reactor for the submarine.

Despite being reported on innumerable occasions by the scientific community and in the press, the existence of the Parallel Program was always denied by the military. Its key stages were the first experiment with uranium enrichment in 1982, and the functioning of the first minicascade of centrifuges in 1984. It was not until 1987 that the program was officially announced. And, in April 1988, the Aramar Experimental Center in Ipero, Sao Paulo was inaugurated to house the main facilities of the program, which today is still under the direct control of the Navy.

Oversight of Nuclear Programs Examined

PY1809023090 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 39

[Recorded by Monica Medeiros]

[Text] Brasilia—Civilians are still ignoring what is really happening with the nuclear projects being developed in Brazil despite the fact that the Constitution sets forth that Congress should follow and supervise everything done in this area. Almost two years after the promulgation of the Constitution, this important privilege, which was established to give society control and decision-making power in the area of nuclear programs, has not yet been enforced.

Proenvironment Deputy Fabio Feldman (PSDB [Brazilian Social Democracy Party]-Sao Paulo), however, has sponsored some initiatives this year. Feldman is one of the lawmakers who has most fervently fought to get nuclear activities under the control of Congress and scientists. None of his initiatives, however, have resulted in concrete measures, due either to political reasons or technical difficulties.

First, there is a legal problem: The new Chamber of Deputies regulations, which were drawn up last year, do not provide for this new congressional power. The congressional regulations (for the Senate and Chamber of

Deputies) have not even been updated since the promulgation of the Constitution. As a result, no procedures have been established for congressmen to follow nuclear activities in Brazil, much less has any institutional instrument been designed to this effect.

On 28 May 1990, Deputies Feldman, Luiz Henrique da Silveira (PMDB [Brazilian Democratic Movement Party]-Santa Catarina), and Lourdinha Savignon (PT [Workers Party]-Espirito Santo) delivered to Congress President Senator Nelson Carneiro a note requesting the creation of a mixed commission (of senators and deputies) that will design the necessary procedures and institutional instruments to urgently comply with the constitutional mandate to permanently supervise everything dealing with nuclear technology.

They also asked for the designation of a group of congressmen to visit, as official congressional observers, the facilities of the Angra-1 power plant; the Aramar project, in which the Navy is developing a nuclear reactor for submarines; the nuclear dump in Goiania; and the Serra do Caximbo military base, where a nuclear testing facility is believed to have been built.

The note got stuck in bureaucratic procedures, or perhaps it was never even filed; three and a half months after its presentation, the Congressional Board has still not made any decision on the subject.

Feldman complained: Why are we still not overseeing the nuclear projects? Because this outdated congress is unfit to discharge its duties. It merely operates as an agency that endorses executive branch decisions. Congress does not exercise the powers that it established for itself.

He said that the current congressional committees cannot evaluate the situation in the area because of the committee members' lack of specific technical knowledge on the subject. According to him, the committee that should supervise the nuclear field should be made up not only of congressmen but also of scientists with the necessary technical knowledge to understand what is really being done.

On the other hand, the matter cannot be placed under a provisional committee because the Constitution sets forth that the area should be under permanent supervision. Consequently, a specific mechanism must be created for this function.

Recommendations of Nuclear Affairs Group Viewed

PY2209132490 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 20 Sep 90 p 20

[Text] Brasilia—Brazil must continue developing its autonomous nuclear technology program—the so-called parallel program—and must go ahead with the construction of Angra-2 and Angra-3, which are part of the agreement with the FRG. This agreement also provides for the construction of two additional nuclear plants without a public call for bids. These are some of the decisions set forth in the final report of a working group that President Fernando Collor set up to review the Brazilian Nuclear Program. O ESTADO news agency had exclusive access to this report.

The working group does not suggest mechanisms to obtain funds, nor does it mention any figures regarding the money that would be necessary to finish building Angra-2 and Angra-3. The group merely establishes a deadline for putting these power plants in operation: December 1996 for Angra-2 and December 1998 for Angra-3. Two other nuclear plants should be built between the years 2000 and 2010. These plants will be designed locally, and Brazilian industry will be given a chance to participate.

The report states that the fuel rods factory in Rezende, Rio de Janeiro, should be finished. This factory will be able to produce fuel rods at an industrial scale only after the appropriate technology which is being developed in Ipero [Sao Paulo State municipality where the Aramar Experimental Center is located] becomes available.

Since Brazil has practically mastered the fuel cycle, the nuclear program is aimed at a new target: the construction of a pilot plant for the reprocessing uranium with local technology between 1996 and the year 2000. Yet another objective is a plant capable of processing uranium ore into yellow cake [preceding two words in English] (uranium concentrate), also using local technology.

The working group recommended that the separators factory in Rio de Janeiro be closed down. National resources should be concentrated on the project to develop of the ultracentrifuge method for uranium enrichment which is being carried out by the Navy at the Institute for Nuclear and Energy Research (IPEN).

This project was awarded certain priorities under the new nuclear program. One of them is the building of a graphite-controlled, gas-cooled reactor. The report that the working group submitted to the president recommends that a minimum reserve of uranium should be built up at the rate of 100,000 tons per year over the next five years to supply fuel for the nuclear power plants. This reserve is the subject of broad negotiations between government and private businessmen. In the final agreement the government will make give private businessmen geological information and the available technology to manufacture yellow cake. In exchange, private companies will build up the minimum reserve.

Collor Orders Closure of Testing Facility

PY1809165090 Rio de Janeiro Rede Globo Television in Portuguese 2200 GMT 17 Sep 90

[Text] On 18 September President Fernando Collor will travel to Serra do Caximbo, Para. After a meeting with the military ministers and the chief of the Armed Forces

staff, the president ordered the closure of a 1.2-meter diameter hole that is more than 320 meters deep. The hole was to be used to test nuclear explosions.

Tomorrow the president will observe the beginning of the operation, which proves that Brazil will not conduct any nuclear test.

Nuclear Power Plant Shut Down for Repairs

PY2009154590 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Sep 90 p 16

[Text] Rio de Janeiro—The Angra-1 nuclear power plant, located in Angra dos Reis, has once again discontinued its operations, this time because of a mechanical problem detected on 13 September in a dump valve of the secondary water circulation system outside the reactor core. The executive board of the state-run company Furnas [Furnas Electric Power Plants, Incorporated], headquartered in the Botafogo neighborhood, confirmed yesterday that the problem was caused by the pin in the valve's operating shaft. The executive board has said that the problem involves no risk of a radiation leak.

Even though plant operations have been discontinued to repair the valve, the executive board has reported that the measure had already been scheduled. The plant has two three-meter valves that close the flow from a pump that pumps sea water in and out of the plant. The executive board said that the plant will resume operations today or tomorrow. The plant can produce 656 megawatts, which is equivalent to 20 percent of the electricity consumed in Rio de Janeiro.

INPE Masters Fuel Production Technology

90WP0154A Sao Paulo O ESTADO DE SAO PAULO in Portuguese 30 Aug 90 p 15

[Article by Flavio Neri: "INPE Masters Space Fuel Technology"]

[Text] Sao Jose dos Campos—The National Institute of Space Research (INPE) announced yesterday that it has now mastered the technology of the production of fuel for use in controlling the orbit and the attitude (the position of a space vehicle in relation to Earth) of the future Brazilian remote-sensor satellites scheduled to be launched in 1993. Joao Andrade de Carvalho Junior, director of the institute's Combustion and Propulsion Laboratory, announced that it has concluded the project for the synthetization of hydrazine, a high-energy fuel of limited production that is used by the large space ships launched in the United States and in Europe.

Carvalho emphasized the importance of the project and said that the world's producers of hydrazine—the United States, Germany, France, Japan, and Great Britain—ban the transfer of technology used in the production of the fuel at the levels of concentration necessary for its use as a space propellant. He also disclosed that this product is so important in other areas that during the Malvinas war "Argentina had its supply of hydrazine threatened, with the aim of compromising its production of petroleum from wells on land that utilize hydrazine as an agent for collecting oxygen."

In Brazil the product could have numerous applications in the pharmaceutical area. Its derivatives are used as a raw material for the production of sponges in the plastics industry. In the United States, however, 40 percent of the production of hydrazine is used in agriculture, 33 percent in the production of sponges, 15 percent in the treatment of water in boilers, five percent as a rocket propellant, and the rest for various uses including the processing of radioactive metals and the metallization of glass and as an inhibiting agent in chemical processes.

Hydrazine was discovered late in the last century and for many years was merely a laboratory curiosity. During World War II the Germans produced it on a large scale as a propellant for the V-2 rockets that devastated London. Since then hydrazine has become an honorable product. In the Apollo project, which carried man to the moon, hydrazine was the fuel for the service command module and also for the module that carried out the walk on the moon. Today, rockets of the capacity of Ariane and some U.S. space ships use hydrazine as a propellant. Hence the difficulty in obtaining the technology.

The United States and France use hydrazine in a so-called bipropellant system. In this system, when hydrazine comes into contact with another substance it initiates a combustion process. In Brazil the INPE has developed the monopropellant system, in which the hydrazine is placed in a vessel under pressure and passes through a device that decomposes it into gases. By reacting among themselves, these gases liberate enough heat to propel a rocket. "In no more than five years," explained INPE researcher Isabel Cristina Galegao, "we shall also master the bipropellant system, which is much more effective."

Nuclear Waste Reprocessing Technology Mastered

PY1709234390 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

[Report by Fanny Zygband]

[Text] Sao Paulo—Brazil already has the technology to obtain plutonium by reprocessing waste from reactors and have thus mastered one of the most strategic stages of the nuclear cycle. The research was carried out at the Institute for Nuclear and Energy Research (IPEN) by the National Commission for Nuclear Energy (CNEN) which used plutonium simulators, like thorium or cerium, whose chemical behavior is identical to that of plutonium.

According to IPEN experts, the institute, which developed laboratory-scale reprocessing, will be able to produce plutonium on a larger scale three years after Brazilian reactors, respecting international safeguards, begin to supply enough burnt fuel.

This prediction was made by Fuel Cycle Director Alcidio Abrao, research coordinator of waste reprocessing and chief of a 10-person team especially created for this purpose. To master this technology took more than 15 years of studies and the installation of a "cold laboratory," so called because it does not use radioactive material.

All the fuel currently used by Brazilian reactors is purchased abroad and cannot be reprocessed because it is under international safeguard. This is why IPEN experts had to use plutonium simulators to develop this technology.

Abrao reported that some of the technology was acquired by researchers who were sent to study in Germany, France, Spain, and Italy during the 1970's. Since then Brazil has found that all the doors to nuclear technology have been closed because it has not signed the Treaty on the Nonproliferation of Nuclear Weapons.

IPEN Superintendent Spero Penha Morato expects his institute to totally master and demonstrate this technology to the country by 1999, and to pass it on to the industrial sector and to the Aeronautics Ministry, which will need plutonium as a fuel for the reactors it plans to install in satellites and in radar and satellite repeater stations.

According to Morato, the plutonium may also be used by the Navy as fuel for the minireactors to be used in buoy signal systems or by the CNEN for the future development of a regenerator reactor [reator regenerador] which uses uranium and plutonium and which is capable—after nuclear fission—of generating a quantity of plutonium larger than what it consumes to generate energy.

Morato said that as far as technological training is concerned, the IPEN would have been able to produce plutonium within three years had the IEA-1 [Atomic Energy Institute] reactor used by the IPEN for research not been safeguarded by the International Atomic Energy Agency (IAEA).

Before the end of next year, the IPEN will load the reactor with the first totally national fuel (based on enriched uranium) which has been produced together with the Aramar Experimental Center, which the Navy runs in Sao Paulo State. However, given that the reactor is U.S.-made and that as such it is subject to IAEA annual inspections and safeguards, the IPEN may not use the fuel burnt in this reactor for reprocessing.

Morato said that the IPEN will necessarily have to wait until the first Brazilian reactors begins operating. The IPEN will try to adjust its schedule to the terms established by the Navy to finish the Renap 1—the reactor prototype for the nuclear submarine that will be ready for 1996.

Alcidio Abrao said that the research into transforming plutonium into plutonium oxide—an essential component in the manufacture of plutonium in tablets [pastilhas] to be used as nuclear fuel—is at an advanced stage.

To develop this technology, which Abrao considers to be "already started," the IPEN specialists are using thorium and gadolinium, two other plutonium "simulators" with similar chemical reactions.

Based on this, the IPEN program will be subdivided into two parts: one to study the reprocessing of waste and the other to design a plant for the installation of the pilot waster reprocessing miniplant.

Nuclear Graphite Purification Technique Developed

PY1809003090 Rio de Janeiro O GLOBO in Portuguese 16 Sep 90 p 38

[Text] The mastering of the technology to produce pure nuclear graphite was a key point in the Army's nuclear project. The task was begun more than four years ago, and its definitive success only came about in March 1990, when Brazil became the seventh country in the world to produce this strategic element.

General Nelson Querido has said that we already have an experimental quantity that is of a higher quality than foreign batches to which we had access. Our material has a high density, a low level of boron and ash, a strong ability to absorb neutrons, and a good buffer section. The technology was developed jointly with the Tecmat enterprise of Nova Iguacu, Rio de Janeiro State, which has already begun production at the industrial level.

Graphite exists naturally, but due to impurities it can only be used for nonstrategic purposes, such as for pencils. Nuclear graphite needs to be produced artificially and can be used in the manufacture of special electrodes, such as those used for converting uranium paste into hexaflouride of uranium and rocket tubes.

The IPE [Institute for Special Projects] has already finished its pilot plant, where starting with flake [agulha] or regular coke, or with sticky [ligante] or impregnation pitch, the processes of grinding, homogenization, vacuumed mixing, pressing, and cooking, among others, result in the production of pure nuclear graphite.

Deputy Urges Cachimbo Site Inspection

90WP0154B Sao Paulo O ESTADO DE SAO PAULO in Portuguese 25 Aug 90 p 12

[Article by Monica Torres Maia: "Deputy Wants Government To Inspect Serra do Cachimbo"]

[Text] Deputy Fabio Feldman (PSDP [Brazilian Social Democracy Party]—Sao Paulo) yesterday sent to Aristides Junqueira, attorney-general of the Republic, a protest asking for an inspection of the Armed Forces Proving Ground in the Serra do Cachimbo, Para. He also asked that a civilian inquiry be instituted to investigate activities that are being carried out secretly at military installations and that may lead to the construction and testing of military nuclear devices. Feldman wants the government to adopt—or definitively reject—the hypothesis according to which it has the capability of producing an atomic bomb.

The deputy decided to place the matter before the Justice Ministry after trying without success to obtain a direct response from the government. In late May Feldman sent formal requests for information to the Armed Forces General Staff (EMFA) and to the Ministry of Aeronautics concerning the underground installations in the Serra do Cachimbo. The intent was to determine whether the wells being drilled in the area could be used for nuclear weapons tests or for storing radioactive waste.

General Jonas de Morais Correia Neto, director of EMFA, replied that administration of the area is the responsibility of the Aeronautics Ministry. He said that the Cachimbo Proving Ground was created in 1983 by the Aeronautics Ministry "to satisfy urgent requirements in connection with testing and evaluating the equipment in which it is interested." The chief of the EMFA also insisted that he was unaware of the existence of any underground installations in the region. Minister of Aeronautics Socrates da Costa Monteiro also denied that any wells have been drilled in the area under his jurisdiction or that there are any plans for utilizing the proving ground.

"The responses were vague and ambiguous," Feldman commented. "This is undeniably too serious a matter for the Brazilian people to justify its being treated in secrecy," the deputy insisted, emphasizing that the Constitution gives the National Congress responsibility for approval of all nuclear activities in the national territory.

The first accusations in connection with this matter were made in 1986, accompanied by photographs published in the press confirming the existence since 1984 of underground installations in the Serra do Cachimbo Proving Ground. The Mineral Resources Prospecting Company (CPRM) had drilled a well 320 meters in depth and one meter in diameter. According to the Brazilian Physics Association (SBF), the well "is analogous to bores made for underground nuclear explosions of a few kilotons (the unit of measurement for the explosive power of a device)—as listed in the Plowshare Program—that were carried out at the Nevada proving ground in the United States in the 1950's and 1960's." The SFB's allegation is contained in a report published this year.

ISRAEL

Visit of Atomic Energy Agency Official

On Regional Tour

TA0609200990 Jerusalem Israel Television Network in Hebrew 1900 GMT 6 Sep 90

[Text] Hans Martin Blix, director general of the Vienna-based International Atomic Energy Agency [IAEA] and a former Swedish foreign minister, visited Israel yesterday. The visit lasted only 24 hours and was not given any publicity. Blix has been touring other countries in the region—including Iran, but excluding Iraq—in anticipation of the meeting scheduled for Vienna next week on Egypt's proposal calling for the implementation of previous IAEA resolutions about the enforcement of controls on nuclear development in Israel. Blix conferred with members of the Israel Atomic Energy Commission, the cabinet secretary, and the Foreign Ministry's director general, among others. The topic of his talks was the nuclear aspect of the arms race in the region in light of the crisis in the Persian Gulf.

Ne'eman Evaluates Visit

TA0709080690 Jerusalem Domestic Service in English 0500 GMT 7 Sep 90

[Text] Energy Minister Yuval Ne'eman says the International Atomic Energy Commission is showing more understanding for Israel's position and concerns as a result of the Gulf crisis. This emerged during a recent visit of the commission's chairman to Israel.

Professor Ne'eman recalled that a great many restrictions were placed on Israel in the nuclear field after the Israeli Air Force destroyed the Iraqi nuclear reactor, but the chairman's visit was a step toward Israel's reacceptance into the removal of these restrictions, Ne'eman said.

Nuclear Cooperation Accord Signed With Europe

TA0909122190 Jerusalem THE JERUSALEM POST in English 9 Sep 90 p 8

[Report by Judy Siegel]

[Text] An agreement for scientific cooperation between Israel and Cern, the Western European center for nuclear research, was signed late last night at the Plaza Hotel in Jerusalem.

Science and Technology Minister Yuval Ne'eman signed the accord along with Cern director Prof. Carlo Rubier, a Nobel Prize laureate in physics who was in Israel for a 24-hour visit. Cern, with the world's largest nuclear accelerator and other facilities in France and Geneva, is the biggest center for peaceful nuclear research in the world.

Ne'eman, himself a world-renowned nuclear physicist, said that Israeli scientists have until now contributed significantly towards better theoretical understanding of physics. The cooperation agreement with Cern, he said, would allow Israelis to take part in experiments at the Cern accelerator and allow them to contribute even more. He added that he expects the accord would "institutionalize Israeli scientific research and development" within Cern and lead to the purchase of Israeli industrial products by the nuclear research center.

PAKISTAN

Paper Criticizes U.S. Stand on Nuclear Issue

BK2509151190 Lahore THE NATION in English 23 Sep 90 p 4

[Article by Mushahid Hussain: "Oakley's Mission: Reviving the Nuclear Spectre"]

[Text] U.S. Ambassador Robert Oakley's visit to Islamabad had an agenda which is now familiar with Pakistan policy-makers. Far from any focus on the Gulf crisis or Pakistan's disjointed domestic scene, Oakley came with a specific message dealing only with the nuclear issue. His 48-hour journey to Islamabad (he is on vacation in the U.S. till October 5) included meetings at the Foreign Office plus the President, Prime Minister and the Chief of Army Staff.

Oakley's 4-point message to the Pakistani leadership was characteristically blunt and categorical. It reiterated America's long-standing concern on the question of nuclear proliferation and conveyed that "the Bush Administration feels even more strongly than the Reagan Administration" on an issue that has been the single most important cause of friction, and indeed serious divergence of perspective, in bilateral Pakistani-American relations. Given this context Oakley outlined the official U.S. line:

—Pakistan "must freeze all nuclear activities";

—U.S. "concern on the nuclear issue is heightened due to the regional tensions" particularly Pakistan-India ties over the Kashmir insurgency;

—This time around, President Bush "might find it difficult to certify that Pakistan is not engaged in a nuclear weapons programme", an annual requirement of American law before aid is cleared for Pakistan;

—If "Bush is unable to provide this certificate, American aid to Pakistan can be affected".

Interestingly, this is the second formal threat from the United States to cut off aid to Pakistan within the last five months, the first being expressed over alleged Pakistani support to the Kashmiri freedom-fighters in Occupied Kashmir. That unsubstantiated allegation would, in the official American perspective, fall in the purview of US laws regarding "terrorism fomented by a state".

The revival of American pressures over the nuclear issue, in terms of timing, should be seen in three contexts. First, the Oakley message came on the eve of President Ghulam Ishaq Khan's Beijing visit. China was the first country to break the U.S.-led international nuclear embargo on Pakistan, which was in place since 1976, when Chinese Premier Li Peng announce in November 1989 that this country would sell a Nuclear Power Plant to Pakistan. Oakley was telling Pakistan, in effect, not to expand nuclear cooperation with China during the Presidential visit.

Second, in the context of the Gulf crisis and Iraq's known chemical and missile capabiliities, the U.S. is keen to lump together the issue of missiles, chemical and Nuclear weapons in one package so as to convey that U.S. is against all sorts of proliferation and not just against Iraq, but also its "friends" in the region like Pakistan. However, India and Israel are, of course, exempt from such pressures.

Third, the timing is determined by the impending Bush certification which is due any time after October 1, the beginning of the U.S. fiscal year. The last Bush certification came on October 5, 1989, which allowed U.S. aid worth US $590 million for Fiscal Year 1990, including U.S. $230 million in military assistance.

By deploying the ultimate American lever, that of aid, against Pakistan, what does the U.S. hope to achieve? Ironically, this American pressure comes at a time when Pakistani troops have been sent to Saudi Arabia as part of the multinational force operating under the aegis of the U.S. Central Command (CENTCOM). Instead of thanking Pakistan for coming on board the most significant U.S. military build-up in the Third World since the Vietnam War, the American act of reciprocity is renewed arm-twisting on the nuclear issue.

The American design is clear. By seeking to decimate the Iraqi military machine and to pressure Pakistan into acquiescing on the nuclear issue, the United States wants to ensure that a castrated Muslim World will lie prostrate before only two Nuclear powers, both of them Non-Muslim, Israel and India. Bereft of military teeth, the Muslim World will only have a lot of manpower, lot of money (most of it stashed away in Western banks) and lot of "moderate Muslims" ready to do the Americans bidding and willing to accept the twin hegemony of Israel and India.

For Pakistan, such pressure is simply unacceptable. The US position is based on double-standards, it violates Pakistan's sovereign right to seek all available means for our defense and to top it all, it is designed to weaken our security. The only reason India was deterred from attacking Pakistan during Exercise Brass Tacks in 1987 or now during the Kashmir Uprising has been due to fear of Pakistan's Nuclear capability. Succumbing to pressure on this count is tantamount to signing off our sovereignty and assuming a permanent client status vis-a-vis India in South Asia.

In any case, the Americans should be told to dispense with their hypocrisy on this issue, especially when they have consistently and deliberately winked at Israel's nuclear weapons and even India's own covertly expanding programme of developing chemical weapons since 1985, to reinforce its missile and nuclear capability.

2d Badr Satellite Planned for Launch

BK1109055590 Islamabad Domestic Service in Urdu 1500 GMT 10 Sep 90

[Text] After the successful experiment of the country's first satellite, Badr-I, Pakistan will launch its second satellite, Badr-II, into space within the next two years. Addressing a symposium on Pakistan's achievement in space technology in Lahore today, the Space and Upper Atmosphere Research Commission chairman, Dr. Mohammad Shafi Ahmad, said that very successful results have been achieved from Badr-I, adding that considerable information and data have been collected during its orbit in space.

Atomic Energy Commission To Set Up Plants

BK1509115890 Lahore THE NATION in English 15 Sep 90 p 10

[Text] Karachi—Pakistan Atomic Energy Commission (PAEC) is planning to construct in the short-term, a few nuclear power plants with foreign assistance as quickly as possible with a view to alleviate power shortages in the country.

Mention may be made of both France and China which have agreed to provide Pakistan nuclear power plants of 900 MW and 300 MW respectively. Negotiations on the technical and financial aspects of the deal are being reportedly conducted with both the countries. It is expected that the plants could be operative six years after the conclusion of agreements.

For meeting the relatively long-term requirements, efforts are simultaneously being made to develop an indigenous capability to design and construct nuclear power plants together with their components and fuels.

In this way, it is envisaged to establish about 2,000 MW nuclear power capacity by the year 2000 and 8,000 MW by 2010.

Meanwhile, a comprehensive programme of modernisation and upgrading of safety system at Karachi Nuclear Power Plant [KANUPP] is in progress in line with the recommendations of the International Atomic Energy Agency (IAEA).

In upgrading the safety of the plant, PAEC has worked closely with IAEA and invited international safety experts to make an independent check on the various systems.

An IAEA operational safety review team visited KANUPP twice last year and made short as well as long term recommendations for the continued safe operation of the plant.

Inspection of Nuclear Facilities Rejected

BK0810162190 Delhi Domestic Service in English 1530 GMT 8 Oct 90

[Text] Pakistan has categorically stated that it will not throw open its nuclear facilities for inspection by U.S. or any other international team. Speaking to newsmen in Islamabad today, the caretaker prime minister, Mr. Ghulam Mustafa Jatoi, said that the Bush Administration's decision to suspend military aid to Pakistan has come as a surprise. He said Pakistan will not accept any interference by the U.S. in its internal affairs.

Commenting on the U.S. decision to suspend military aid to Pakistan, an official spokesman said in New Delhi today that India has always maintained and believed that Pakistan's nuclear program has been clandestine and weapons oriented in nature. He said we have noted that this fact has been taken note of by persons and authority in Washington.

Kazakh Nuclear Fuel Plant Explosion Detailed

914E0001A Moscow RABOCHAYA TRIBUNA in Russian 5 Oct 90 p 2

[Statement by B. Barchenko, Kazakh SSR people's deputy, worker of the Ust-Kamenogorsk Lead and Zinc Combine, recorded by RABOCHAYA TRIBUNA staff correspondent Yu. Kirinitsiyanov: "Before and After the Accident"]

[Text] B. Barchenko, Kazakh Soviet Socialist Republic [SSR] people's deputy, worker of the Ust-Kamenogorsk Lead and Zinc Combine, reflects on the lessons of a tragedy that took place in his native city: an explosion at a nuclear fuel plant (see RABOCHAYA TRIBUNA, 16 and 21 September 1990).

I learned about what had happened from my daughter. Calling me from Ust-Kamenogorsk, she said that there was panic in the city. People wearing gas masks and respirators were running through the streets. I reassured her as best I could. I advised her to close the transom and not to leave home. After all, I worked for 30 years in a harmful production environment.

When I started dialing Ust-Kamenogorsk later, nothing happened. Even the reception room of the party oblast committee [obkom] first secretary did not answer. They put me through to the reception room only after I called a long-distance telephone exchange using the government communications line. A secretary told me that a meeting of the Oblast Soviet Presidium was in progress. There was no other information. As far as the rest of the phones were concerned, fuses blew at the exchanges, according to the official version. When they finally switched back on, one of the activists who supported me in my election campaign managed to call me. He reported that officials, and primarily the management of the plant at which the accident occurred, concealed the true picture from the people. This was when I decided to fly to Ust-Kamenogorsk.

The data I was given by ecologist voters differed substantially from the official data.

I rushed to an extraordinary session of the city soviet. Chairman of the city soviet N. Nosikov gave me the floor very reluctantly. However, at this point I was given a letter from the workers of the Eastern Machine Building Plant, incidentally, my constituents. The people demanded honest and complete information.

One of the managers from the Ulba Metallurgical Plant poured oil on the fire. In the evening, speaking on television, he stated: There is no need to check children in the city, because even the rescue personnel putting out the fire in the center of the accident area were not injured... It turned out later that, putting it mildly, this was not quite so.

On the following day, a meeting of the city emergency headquarters was held. Certain discordant notes had to be introduced into the overall chorus of soothing voices. It turned out that the plant does not have an accident contingency plan, surprising as it may be. Indeed, Chernobyl did not teach us anything. Meanwhile, the "master" of both accidents is one and the same, the Ministry of the Atomic Power Industry. However, the fact that the ministry is imperiling the physical health of people is not the only scary one. It also cripples the people morally. I visited the Ulba Metallurgical Plant and met with General Director V. Mette. It appeared that his optimistic declarations did not reassure the people, just merely dampened their ardor.

Civil defense is a separate topic. Its representatives displayed complete helplessness once again. A message was broadcast on the radio after a long delay, and only on one channel rather than on three. Following a similar "glitch" during an earthquake, I addressed a deputy inquiry to them, but did not get a reply. Another detail: It turns out that the bulk of the means of individual protection are located in a village dozens of kilometers away from the city.

Finally, the mechanism was set in motion, if not without friction. Municipal services are washing the city and physicians are examining the sick. Finally, the Presidium of the oblast soviet made the decision to close down beryllium production. This is supposed to be a victory, but there is a strong bitter aftertaste. I foresee most powerful pressure from the mighty ministry. This is not the only thing that bothers me, though. I am afraid that the attitude toward the nuclear plant will be extended to its completely innocent workers.

The citizens found themselves in a disaster area, not only as a result of this accident, but also as a result of the long operation of giant nonferrous metallurgy and defense industry enterprise within the city limits. I propose to envisage for the citizens income tax relief and an improved supply of foodstuffs (meat, milk, fruits). To this end, deliveries to all-Union stocks from East Kazakhstan Oblast should be reduced at least temporarily. It is necessary to consider the issue of evacuating children to holiday homes and country schools.

However, this is not enough. I believe that the Ust-Kamenogorsk accident should become a stern lesson for all ministries, including "my own" ministry, the USSR Ministry of Nonferrous Metallurgy. We should finally resolve to suspend all harmful production, and repair and adjust ecological facilities within a short period of time. Where are we to get money? Taking into account new approaches to taxing industrial enterprises, it is necessary to envisage the possibility of reducing contributions to the state budget and to superior establishments for a certain period of time. This will make it possible to allocate the funds saved for target-oriented ecological programs and reduce the probability of new catastrophes.

AUSTRIA

Country's Neighbors Urged To Drop Nuclear Energy

AU1609171890 Vienna WIENER ZEITUNG in German 14 Sep 90 p 1

[Text] Chancellor Franz Vranitzky has confirmed his intention to persuade Austria's neighbors to drop nuclear energy. He said that the goal should be to turn Central Europe into a zone without nuclear reactors.

Vranitzky made this statement in the Chancellor's Office in Vienna yesterday [13 September], following talks with representatives of the Forum on Nuclear Problems which is in charge of examining the Slovak reactors at Jaslovske Bohunice.

In connection with the move against nuclear energy that the chancellor made at the meeting of the Pentagonal Association in Venice late in July, Vranitzky said that Italy intends to close its two nuclear power plants in the south of the country, and that the nuclear reactor at Krsko in Slovenia will also be switched off. "So now the only problem left is the CSFR and Hungary," said Vranitzky, defining his course.

At a later date, the nuclear reactors of Austria's western neighbors, Switzerland and the FRG, could eventually be closed, the chancellor said. The work of the experts examining Bohunice will presumably lead to the issue of aging nuclear power plants, and this topic will then be internationalized, said Vranitzky.

Vranitzky stressed that in view of the interim report given by the two forum chairmen, Professor Manfred Heindler and Helga Kolb, he does not see a reason to revise his negative position on Bohunice. He said that Austria's objections to this reactor have so far not been refuted. Nor does he expect the result of the expert commissions' work to "produce any serious arguments that might weaken these objections."

That the security standard of Bohunice, according to a report of the International Atomic Energy Organization (IAEO), "is not as bad as had been expected," is of "no importance" to the Austrian Government, said Vranitzky, and added: "We only base our considerations on the result of our own commission."

CANADA

AECB Critical of Hydro-Quebec Management of Gentilly

90WP0155A Toronto THE GLOBE AND MAIL in English 24 Aug 90 p B5

[Excerpts] Ottawa—The Atomic Energy Control Board [AECB] has renewed the operating licence of the Gentilly 2 nuclear plant near Becancour, Quebec, although one of the board's experts says the plant's operators have shown a careless attitude.

The licence has been renewed for two years, as requested by Hydro-Quebec, despite vigorous objections by a regional delegation that crashed a board meeting yesterday.

The delegation sought full public hearings b fore a decision on the licence renewal. [passage omitted]

Robert Leblanc, a control board expert, recommended that the licence be renewed, but was critical of Hydro-Quebec management.

He said there were six violations of the plant's operating policies and principles in 1988. A training program was introduced in an effort to correct problems, yet there have been even more violations this year, he added.

"If we look at each of these violations, we can convince ourselves that each of them didn't result in a degradation of the safety of the plant, but when you look at the total number of them, this could indicate a careless attitude," he said. [passage omitted]

Mr. Leblanc also said Hydro-Quebec has often failed to report accidents and procedural violations within the two-month limit set by board regulations.

In its ruling, the board urged Hydro-Quebec "to increase its information flow in the Becancour area in recognition of the many outstanding questions...not least of which are a number concerning off-site emergency plans."

Hydro-Quebec official Roland Boucher said the utility is working hard to overcome problems and conceded it has had difficulty attracting highly qualified managers.

"If we could find 20 people qualified as senior managers, we would be very happy. But you don't find those people on the street."

GERMANY

Illegal Arms Sales To Result in Greater Punishment

AU1309113390 Frankfurt/Main FRANKFURTER RUNDSCHAU in German 13 Sep 90 p 4

["rei" report: "More Severe Punishment for Illegal Arms Sales"]

[Text] Bonn, 12 September—Breaches of the weapons export law are to become more severely punishable than recently planned. The mediation committee of the Bundestag and Bundesrat decided in Bonn on Wednesday [12 September] to increase the minimum sentence for violations of the ban on the production and the spreading of nuclear and chemical weapons from one to two years.

North Rhine-Westphalia's Interior Minister Schnoor (Social Democratic Party of Germany) justified this measure by stating that a minimum sentence of one year is not in keeping with the danger posed by these weapons. For this reason, the stricter penal provisions of

the original draft prepared by the government, which was watered down by the coalition in the Bundestag, must be adopted. It must also be possible to punish without restrictions perpetrators who act in a thoughtless manner. Punishment in the case of negligence was so far only possible if the offense entailed "consequences that were not insignificant." The "science clause" will be deleted, which explicitly guarantees exemption from punishment in the case of the careless dissemination of special knowledge.

The mediation committee adopted amendments to the law package on data protection and intelligence services. The control rights of the commissioner for data protection in the public sphere are to be extended. In addition, data may only be used for the purpose for which they were gathered. The Office for the Protection of the Constitution must not have direct access to police computers.

East German Nuclear Power Plants To Be Shut Down

AU0709101890 Berlin NEUE ZEIT in German 3 Sep 90 p 2

[NZ/ADN report: "GDR Nuclear Power Plants Will Be Shut Down"]

[Excerpt] Saarbrucken—After the GDR's accession to the FRG on 3 October, the GDR nuclear power plants will be shut down for safety reasons, Martin Bangemann, vice president of the EC Commission, announced. Responsibility cannot be accepted "for such facilities that do not correspond to our safety regulations to continue working." Bangemann expressed the expectation that the demand for energy resulting from this step will be covered through electricity links to the EC. [passage omitted]

Toepfer on East German Nuclear Power Sector Problems

LD1109095690 Hamburg DPA in German 0852 GMT 11 Sep 90

[Excerpt] Bonn (DPA)—The GDR nuclear energy sector is facing final collapse. FRG Environment Minister Klaus Toepfer (Christian Democratic Union), speaking to journalists in Bonn today, made it clear that not only are the four oldest reactor blocks in Greifswald to be shut down, but that for the plants under construction there and in Stendal considerable technical updating to improve safety is needed "in principle." The results of a detailed examination are to be published in early 1991. But in any case, Bonn will incur the expenditure of billions (of marks [DM]), because the Trusteeship Authority will be the new owner after 3 October.

Toepfer explained that the four old blocks in Greifswald have expressly been excluded from the energy supply treaty concluded between the West German power giants and the Trusteeship Authority. The enterprises would be prepared to take over the other plants only if they were given a statutory licence to operate permanently. The minister implied this presupposes that should updating of the four reactor blocks in Greifsward and of the A and B blocks in Stendal, most of which are still under construction, be necessary, then the FRG Government would once again have to foot the bill.

However, Bonn is likely to be asked for money, even if updating is considered either impossible or too expensive. Because the GDR has concluded with the Soviet Union supply contracts for the reactors—an amount of DM7 billion is mooted—the Federal Republic would then face penalty clauses. [passage omitted]

Max Planck Institute Opens Experimental Fusion Plant

90MI0336X Bonn WISSENSCHAFT WIRTSCHAFT POLITIK in German No 32, 8 Aug 90 p 6

[Text] In view of the increasing energy consumption of a growing world population, the associated environmental problems, and the limited availability of conventional energy sources, the highly developed industrial nations have a special responsibility to provide a long-term energy supply with safe, environment-friendly, resource-saving energy sources. Inaugurating the new ASDEX Upgrade large-scale nuclear fusion experiment at the Max Planck Institute of Plasma Physics (IPP) in Garching, the parliamentary secretary of state at the FRG Ministry of Research and Technology (BMFT), Dr. Probst, said: We have only a few options open to us at present: solar energy, nuclear fission, and nuclear fusion. We must pursue all three options; especially with regard to climatic problems, we cannot afford to neglect a single one of them. We must not relax our research and development efforts." This holds good regardless of the fact that commercial power generation from fusion and solar energy is still a long way off.

The aim of this fusion facility, the largest to date in the FRG, is to study central fusion research questions in conditions similar to those in a reactor. Now that sufficiently dense plasmas have been successfully confined in a stable form and heated to the requisite ignition temperature, the problems arising out of the interaction between the hot plasma and the surrounding walls have now become the main subject for study. The IPP's ASDEX experiment has already made a decisive contribution to solving these problems: The results were so significant that the European Community's JET (Joint European Torus) experiment in Culham, England, is currently being converted to this model. The ASDEX Upgrade follow-up experiment now ready to start can do without burning plasma and a full-scale reactor to achieve its scientific target. However, it has been designed in such a way that it will provide substantial results for the next large-scale international fusion reactor planned.

The main components for ASDEX Upgrade—the plasma container, the magnetizing coils, and their support—were developed and built back in 1983; it took about two years just to set the experiment up. ASDEX Upgrade's investment costs run to about 200 million Deutsche marks [DM]. The BMFT provided about half of this sum, about DM90 million came from the European Fusion Program, and about DM10 million was added by the Free State of Bavaria. The FRG Minister for Research and Technology is subsidizing fusion research with a total of DM200 million in 1990. The IPP is receiving about DM85 Million from the BMFT for 1990.

FINLAND

Concern Over Kola, Novaya Zemlya as Possible Waste Sites

90WP0134A Helsinki HELSINGIN SANOMAT in Finnish 3 Aug 90 p 8

[Article: "Kola and Novaya Zemlya Proposed as Nuclear Waste Burial Sites; Finns Have No Report on Projects Yet"]

[Text] Loviisa (HS)—Kola and Novaya Zemlya are the new proposals for Soviet nuclear waste burial sites. The Kola area has been investigated for nuclear waste repository sites. According to the Oulu magazine KALEVA, Yuriy Yevdokimov, the new governor of Murmansk, has proposed that a nuclear waste storage facility be located on the uninhabited island of Novaya Zemlya.

Finland has received no official report on the studies that may have begun in the Soviet Union. Officials of the Radiation Safety Center, the Trade and Industry Ministry, and the Environment Ministry who are responsible for nuclear waste concerns are unaware of the matter.

The Soviet Union's plans are of interest especially to the Imatra Power Company (IVO) because the company delivers the spent fuel from the Loviisa power plants to the Soviet Union.

They have not heard anything about the new studies at IVO, either. This does not, however, mean that the report is unfounded because the news of the nuclear power plants planned for Soviet Karelia also reached IVO through the newspapers.

Waste From Loviisa to the Urals

The spent fuel from the Loviisa nuclear power plants is stored at the Hastholmen power plants for five years before it is shipped to the Soviet Union. There it ends up at the nuclear waste processing plant in Chelyabinsk in the Southern Urals.

The week before last, the Russian Congress of Deputies charged the Council of Ministers with drafting proposals the object of which is to ban the permanent burial of waste produced by nuclear power plants in the other Soviet republics and abroad on Russian territory.

It may be difficult to implement the decision. The Chelyabinsk plant at present employs about 10,000 persons. Transferring personnel and equipment elsewhere is a big job.

A plant is also being built at Krasnoyarsk in the Soviet Union that would be capable of handling the waste from 1,000 megawatt plants. This plant should be ready by 1997. On the basis of the timetable for Krasnoyarsk, the timetables for Murmansk and Novaya Zemlya seem to be critical. The decisions have not yet been made, but the nuclear waste burial sites should be ready within five years.

In Finland the Industrial Power Company has been conducting studies on a permanent repository for nuclear waste that comes from the nuclear power plants at Olkiluoto. The repository site should be decided on by the end of this decade, and the rock storage site itself by 2020 at the latest. The nuclear burial pit will be about 500 meters deep. About 1,300 tons of spent nuclear fuel will be deposited in it.

It will cost about 2.1 billion markkas to build the storage facility for spent fuel waste from the Olkiluoto plants.

IVO reported that the company still relies on the agreements concluded with the Soviet Technadexport for the return of spent fuel.

Negotiations on common storage have not been set in motion with the Industrial Power Company—at least no so far.

Russian Threat To Halt Waste Shipments

90WP0134B Helsinki HELSINGIN SANOMAT in Finnish 3 Aug 90 p 7

[From roundup of editorials excerpted by HELSINGIN SANOMAT: "Finland Is Responsible for Its Own Nuclear Waste"]

[Text] The independent ETELA-SUOMEN SANOMAT is worried about the fate of our nuclear waste.

According to a decision reached by the Soviet Republic of Russia, the republic will no longer accept spent nuclear fuel from the other Soviet republics or from abroad.

Up to now, fuel from the two Loviisa nuclear power plants has been shipped to the Soviet Union after temporary storage here.

According to the newspaper, the Imatra Power Company can no longer be certain that fuel waste generated in Loviisa will be accepted by a Soviet Union caught up in a confused situation.

"Since Finland has been resorting and will probably in future as well have to resort to nuclear power, the most

morally acceptable position is to also assume responsibility for the problems produced by these operations," the paper writes.

"Finland must adopt a new attitude: If we use nuclear power, we must also be prepared to permanently store any and all waste in our own territory."

FRANCE

Poor Superphenix Reactor Performance

90WP0149A Paris LIBERATION in French 17 Aug 90 p 19

[Interview with Jean Dubouis, deputy director of the Creys-Malville breeder reactor facility, by Jean-Paul Savart; place and date not given: "Heavy Clouds Gathering Over Superphenix"—first paragraph is LIBERATION introduction]

[Excerpt] The Creys-Malville breeder reactor has been in actual operation only six months out of its four-year existence. Does the constant stream of problems mean dim prospects for the future? Jean Dubouis, deputy director of the facility, discusses the question...

What if the Superphenix, which has been idle since 3 July, were never started up again? When the assembly goes back into session, Industry Minister Roger Fauroux is expected to inform the president of EDF [French Power Company] he is very unhappy with the breeder reactor. EDF's wrist has already been slapped by the SCSIN [Central Safety Service of Nuclear Installations] for foot-dragging, both in identifying the cause of the latest in a very long list of "incidents," and in reaching the decision to shut the reactor down again.

Since its opening in 1986, Superphenix has operated at its full capacity of 1,300 mW for only 6 months. Moreover, it has had a dozen breakdowns, several of which pointed to deficiencies in the monitoring system.

In May 1987, it took three weeks to identify a sodium leak in a piston. The power plant had been shut down for nearly two years. Following a further prolonged shutdown, it had just been connected into the power grid when sodium oxidation problems surfaced in June.

Jean Dubouis, Creys-Malville's deputy director, is not one to try to minimize the problems...

[Savart] Why did it take you two weeks to ascertain that air was getting into the reactor's primary confinement vessel and measure the oxidation?

[Dubouis] It was a design inadequacy. There is currently no device capable of continuously monitoring the purity of the argon layer above the sodium. The small amount of air that got in was not taken into account. The oxidation is a complex measuring problem. Every time we start up the reactor, we have seen the level of impurities increase before settling back down. When we realized the level was not returning back to normal, we brought in experts on the sodium chemistry. Everyone had misinterpreted the data. It was only after the fact, after the reactor was shut down, that we realized the maximum acceptable value had been exceeded since 20 June.

[Savart] Would you have shut it down on 3 July if there had not also been an electric outage?

[Dubouis] Absolutely. The shutdown had been scheduled for 1630 hours that day. The power failure happened just before that.

[Savart] But the reactor should have been shut down earlier.

[Dubouis] Yes, but only because of interpretive errors, since no one realized the limiting value had been exceeded.

[Savart] Could oxidation have caused the nuclear reaction to race out of control?

[Dubouis] No, it had nothing to do with safety. There was simply too much oxidation, which means corrosion and thus a shorter operational life for the reactor. There was no safety risk.

[Savart] FRAPNA-Isere (Rhone-Alps Federation of Associations for the Protection of Nature) says two of the 18 possible accidents analyzed in the safety report (probability of 1 in 10,000 over 1 million years of operation) have already occurred. Doesn't that tend to discredit those probability studies?

[Dubouis] The problems that have descended on us are especially irritating in that they force the plant to shut down despite the fact that they pose no real safety risk. I distinguish between an incident and an accident. Here at Superphenix, we have had incidents, but they have not affected safety. They have not threatened to release radioactivity into the environment.

[Savart] But there have been so many of these incidents...

[Dubouis] That is true, and it has led to a large amount of "down" time. Ten percent "up" time over a four and a half year period is not a very impressive track record.

[Savart] Is the current shutdown likely to last long?

[Dubouis] The best we can hope for is to get started again in October.

[Savart] Will the breakdown be costly to repair?

[Dubouis] Superphenix has cost Fr27 billion so far. These repairs will not run into the billions. The really upsetting part about the incident is that it keeps us out of production.

[Savart] Normally, EDF's response would be that a prototype cannot turn a profit.

[Dubouis] It is obvious that Superphenix, even under the most optimistic assumptions, will not be able to pay for the investment that has gone into it. In fact, it may have been a mistake to install the generators. If the project were devoted exclusively to research everyone would think it quite natural for us to spend money without producing anything. [passage omitted]

Problems Halt 2d Fast-Breeder N-Plant

AU1209131490 Paris AFP in English 1246 GMT 12 Sep 90

[Text] Paris, Sept 12 (AFP)—After years of problems with its Superphenix plant at Creys-Malville, France's fast-breeder reactors were in more trouble Wednesday with the breakdown of the Phenix plant at Marcoule in southeastern France.

The incident marks a further setback for the state EDF electricity board whose Superphenix plant, the biggest breeder-reactor in Europe, has been halted for several months for repairs. The plant, which was hailed as milestone in nuclear technology, has operated at full power for only 175 days since it went into service in January 1986, according to a recent report.

Nuclear safety officials on Wednesday said the fault at the Marcoule reactor was "on the basis of a first analysis" due to a bubble of argon gas in the reactor core. This had caused a reduction of power and led to the automatic shut-down of the reactor on Sunday.

The incident had been given a Number-2 gravity rating on a six-grade scale of nuclear accidents, officials said.

The Marcoule plant, which went into service in 1973, had to be shut down three times last year after similar breakdowns. On one occasion it was out of action for three months.

The Superphenix plant in the Alpine region of eastern France, commissioned as the "jewel" of the French nuclear industry, has been plagued by problems from its inception. It has produced only 1,300 megawatts of electricity in nearly four years and at a price far higher than conventional nuclear plants.

NORWAY

Planned Soviet Kola Nuclear Plant Opposed

Possible Threat Discussed

90EN0830A Oslo AFTENPOSTEN in Norwegian 14 Aug 90 p 2

[Guest commentary by Rune Castberg, researcher at Fridtjof Nansen Institute: "A Nuclear Risk for Norway"—first paragraph is AFTENPOSTEN introduction]

[Text] It is reasonable to assume that the many nuclear reactors and the large quantity of strongly radioactive materials on the Kola Pensinsula represent a risk for Norwegian territory, the author of this article says.

On 2 August 1990, AFTENPOSTEN published a piece by Konstantin Ivanov of APN whose purpose was to reassure those who are concerned about the lack of information regarding safety at the Kola nuclear power plant. According to the deputy chief of the Soviet information office for nuclear energy, who was quoted in the article, there allegedly is "no reason to be concerned."

His main argument is that the two new reactors at the power plant that is under construction will provide "better safety than the previous types of reactors." In other words, that means that the reactors that are in operation at present do not provide such a high degree of safety. Thus, until the two new reactors are finished (in about 2000), people will be dependent upon the existing plants, which have a lower degree of safety. That does not sound entirely convincing.

The four VVER-440 reactors at the Kola nuclear power plant, which lies on the southern shore of the Imandra Lake, were completed, respectively, in 1973, 1974, 1981 and 1984. The two oldest apparently are included in a group of reactors that, according to the authority responsible for supervising the Soviet Union's nuclear industry, does not satisfy present-day safety requirements (Cf. IZVESTIYA of 11 January 1990 and 10 February 1990). Kolenergo, the energy plant in the county of Murmansk, states that those two reactors are to be rebuilt in 1993 and 1994. While the rebuilding is going on, each of them will be shut down for half a year. That means that there will be electricity supply problems for the Kola Peninsula, and that probably is the reason why the rebuilding has been postponed. The two reactors are to continue to deliver power for ten years after the rebuilding is completed. We do not know whether they plan also to modernize the remaining VVER-440 reactors. The Kola nuclear power plant is reckoned to be among the best operated in the Soviet Union, and the statistics on unplanned stoppages seem to support that belief.

The Kola nuclear power plant is located 250 kilometers from Kirkenes. The nuclear icebreaker fleet, the many nuclear-powered naval vessels and other military nuclear installations are only approximately 150 kilometers away. We are talking here about the world's biggest accumulation of maritime nuclear reactors, with the great majority of those being naval reactors. A large part of the naval fleet is ordinarily in port at all times. The attention and concern of the population of the Kola Peninsula has been concentrated on those vessels and installations, and primarily the civilian ones, to a great extent. There is a population of 600,000 individuals in the immediate vicinity. (The cities of Murmansk, Severomorsk, Polyarnyy, and Kola are all located on Kola Bay.) In the spring 1990 election, many of the candidates for the local soviets called for the civilian icebreakers to be moved away from the city of Murmansk. The soviet of that city decided to distribute potassium iodide preparations to the population in advance as a precaution

against a nuclear accident. In the Lenin district of Murmansk, that was done early in the spring of 1990. It also happened in various factories in the area. Local newspapers provided information on how the preparation should be used and how one should act in case of a nuclear accident.

During the 30 years that civilian nuclear icebreakers have been in Murmansk, no permanent system for handling used fuel and radioactive waste has been established. At present, the highly radioactive used fuel is stored temporarily aboard specially-built vessels before being reloaded onto trains and transported to the recovery plant off the Kola Peninsula. At present there are dozens of tons of used fuel on ships in Kola Bay, and the quantity is growing bigger as the fleet grows bigger. The Murmansk shipping company will soon have eight nuclear-powered ships, plus five nuclear waste storage ships.

Safety Risk

Individual Soviet nuclear experts think that the reloading onto trains that takes place in a city is a safety risk. It is also maintained that the railroad cars that are used do not satisfy the current safety requirements. A railroad accident could cause serious damage. The Murmansk shipping company and the Ministry of the Maritime Fleet are criticized for being too slow in procuring safer railroad equipment, which results in unnecessarily big accumulations of radioactive material, among other things.

Another problem is the approaching condemnation of the nuclear waste storage ship Lepse. It is suggested, among other things, that fuel and radioactive waste be allowed to remain in the boat and that the whole thing be walled in in a solid mass, making a floating sarcophagus similar to Chernobyl in that way.

Doubtless there is a need to build safe storage installations on the Kola Peninsula. An installation is under construction at the civilian nuclear-powered fleet's port installation in Murmansk, but it presumably is located too close to the city and the bay. The nuclear expert V.A. Perovskiy has hinted to the Murmansk newspaper POLYARNAYA PRAVDA that the military people farther north on Kola Bay also have not succeeded in working out satisfactory solutions to the transportation and storage problems. He thinks the two organizations should cooperate on developing a safe infrastructure and permanent installations.

Cooperation

The representatives elected by the people in Murmansk evidently think that a danger of nuclear accidents exists. The distribution of iodine tablets in advance indicates that. It is reasonable to assume that the many reactors and the large quantity of strongly radioactive material on the Kola Peninsula also represent a risk for Norwegian territory. The Norwegian central and local authorities should acquire knowledge that makes it possible for them to evaluate that risk and, if necessary, to put special precautionary measures into effect on the Norwegian side of the border, too. Furthermore, they should consider whether it would be appropriate to establish joint Norwegian-Soviet arrangements that would be able to reduce the harmful effects of a nuclear accident and, if possible, also reduce the probability that such accidents will occur.

A Norwegian-Soviet agreement on timely warnings in case of nuclear accidents exists at present. It is not particularly binding, and it does not define the precise criteria covering situations that call for such warnings to be given. It is of great interest to our country for the bilateral cooperation on nuclear safety to be expanded and made more binding, among other things, when it is a matter of information on activities related to nuclear power.

As Konstantin Ivanov pointed out, there is a connection between a lack of information and the people's anxiety and fear. Such feelings have been expressed on the Kola Peninsula recently. Norwegian nuclear experts' assessment of nuclear safety can be of value not only in Norway, but also for the Soviet people, who often have little confidence in their own authorities.

Deliberations Outlined

90EN0830B Oslo AFTENPOSTEN in Norwegian 15 Aug 90 p 3

[Unattributed article: "Undetermined Whether Nuclear Base on Novaya Zemlya"]

[Text] NTB—Under Secretary Knut Vollebaek of the Foreign Affairs Ministry did not get any promises that the Soviet nuclear test firings program will not be moved to Novaya Zemlya when he met representatives of the Soviet authorities in the Kremlin yesterday, 14 August 1990. On the other hand, he got the rumor that a Soviet nuclear test firing was very imminent, denied.

During his conversation with Deputy Foreign Minister Igor Rogachev and Disarmament Chief Anatoliy Belov, it was stated emphatically that the Supreme Soviet still had not come to a decision on that matter. An ad hoc committee under the Supreme Soviet is now considering the consequences of the use of two test firing fields, with Novaya Zemlya being one of them. The committee is to report back to the government, which will give its recommendation to the Supreme Soviet.

"Therefore I do not think that there is any reason to expect any immediate surprises. It will be quite a while, perhaps months, before a decision will be made on that question," Vollebaek told the NTB.

He says that the Norwegian authorities, who now have taken that question up with Soviet authorities four times, want an open process, with contact on the parliamentary level as well as on the governmental level.

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